

From: [Nathan Baker](#)
To: [Shiley, Alex \(EFSEC\)](#)
Cc: [Thompson, Jonathan C \(ATG\)](#); [Steve McCoy](#); [Rick Aramburu](#); [Owens, Joan \(EFSEC\)](#); [Grantham, Andrea \(EFSEC\)](#)
Subject: FW: Whistling Ridge Energy Project - Extension Request
Date: Wednesday, June 19, 2024 9:51:56 PM
Attachments: [image001.png](#)
[Declaration of Dean Apostol.pdf](#)
[Declaration of Shawn Smallwood.pdf](#)
Importance: High

External Email

Friends of the Columbia Gorge requests that EFSEC staff, **prior to June 20 at 12:30 p.m.**, complete the following four actions:

1. Share the attached two Declarations with the Council,
2. Place the attached two Declarations in the administrative record for the pending Extension Request for the Whistling Ridge Energy Project,
3. Post the attached two Declarations on EFSEC's website, and
4. provide confirmation by email to Friends of the Columbia Gorge (at nathan@gorgefriends.org and steve@gorgefriends.org) that the first three actions have been completed.

For more information, please see the email correspondence below.

Thank you very much.

Nathan Baker, Senior Staff Attorney
Friends of the Columbia Gorge
nathan@gorgefriends.org
(503) 241-3762 x101

From: Nathan Baker <Nathan@gorgefriends.org>
Sent: Wednesday, May 29, 2024 11:40 AM
To: Joan Owens <joan.owens@efsec.wa.gov>; Andrea Grantham <andrea.grantham@efsec.wa.gov>
Cc: Jonathan Thompson <jonathan.thompson@atg.wa.gov>
Subject: FW: Whistling Ridge Energy Project - Extension Request

Neither this email nor its attachments, which were submitted for the Extension Request matter, appear on EFSEC's website.

It isn't necessary for the email to be posted on the website, but both Declarations should be posted there.

Or at the very least, if there is a valid reason to *not* post these Declarations on the EFSEC website, please confirm that the Declarations have been included in the administrative record for the Extension Request and have been shared with the Council.

Thank you.

Nathan Baker, Senior Staff Attorney
Friends of the Columbia Gorge
nathan@gorgefriends.org
(503) 241-3762 x101

From: Nathan Baker

Sent: Tuesday, May 14, 2024 7:09 PM

To: comments@efsec.wa.gov

Cc: Rick Aramburu <rick@aramburulaw.com>; Bryan Telegin <bryan@teleginlaw.com>; Steve McCoy <steve@gorgefriends.org>; Dean Apostol <dean.apostol@gmail.com>; Shawn Smallwood <puma@dcn.org>; Yuriy Korol <yuriy.korol@atg.wa.gov>

Subject: Whistling Ridge Energy Project - Extension Request

To Whom It May Concern:

Please find attached the following documents for filing by Friends of the Columbia Gorge and Save Our Scenic Area in the Whistling Ridge Energy Project – Extension Request matter:

- Declaration of Dean Apostol
- Declaration of Shawn Smallwood

Thank you very much.



Nathan Baker
Senior Staff Attorney
Friends of the Columbia Gorge

[123 NE 3rd Ave., Suite 108](https://www.focg.org/123-NE-3rd-Ave-Suite-108-Portland-OR-97232-2975)
[Portland, OR 97232-2975](https://www.focg.org/123-NE-3rd-Ave-Suite-108-Portland-OR-97232-2975)
nathan@gorgefriends.org
(503) 241-3762 x101

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29

BEFORE THE STATE OF WASHINGTON
ENERGY FACILITY SITE EVALUATION COUNCIL

In the Matter of Whistling Ridge Energy,
LLC's September 13, 2023 Request to
Extend the Term of the 2012 Site
Certification Agreement for the
Whistling Ridge Energy Project

DECLARATION OF DEAN APOSTOL

I, DEAN APOSTOL, make this Declaration based upon my personal knowledge and belief and declare as follows:

The following questions are from Friends of the Columbia Gorge and Save Our Scenic Area, and the answers are mine.

Q. Are you over the age of eighteen (18) and competent to testify in this matter?

A. Yes.

Q. Please state your name and address.

A. My name is Dean Apostol. My business address is 23850 SE Borges Road, Damascus, OR 97089.

Q. At whose request have you prepared this Declaration?

A. Friends of the Columbia Gorge and Save Our Scenic Area.

Q. What is your professional occupation, experience, and areas of expertise?

A. I am a professional visual resource expert with over 44 years experience. I am currently self-

1 employed and do consulting work with several firms, consulting on natural resource and
2 renewable energy projects regionally and nationally. My areas of professional emphasis
3 include scenic resource assessment, natural resource planning, landscape ecology and
4 ecological restoration. My clients have included numerous government bodies, nonprofit
5 organizations, and private businesses, including the Oregon Department of Transportation,
6 the U.S. Forest Service, the National Park Service, the Washington Forest Law Center, the
7 Forest Stewardship Council, Metro (regional government for the greater Portland
8 metropolitan area), Friends of the Columbia Gorge, and several private landowners,
9 including some located within the Columbia River Gorge National Scenic Area. Prior to
10 reentering private practice in 1996, I was chief landscape architect at Mt. Hood National
11 Forest. My work included having the lead role for management of scenic resources and
12 implementation of scenic resource management principles, and design of several projects
13 within the Columbia River Gorge. My qualifications are more completely listed in the
14 attached Exhibit A.

15 Q. Are you familiar with the Whistling Ridge Energy Project (“WREP” or “Project”)?

16 A. Yes.

17 Q. Did you testify as an expert witness for Friends of the Columbia Gorge and Save Our Scenic
18 Area in the 2010–2011 adjudicative proceeding for the Whistling Ridge Energy Project
19 conducted by the Washington Energy Facility Site Evaluation Council (“EFSC”)?

20 A. Yes.

21 Q. Have you recently reviewed your written and oral testimony and exhibits (Exhibits 21.00,
22 21.01, 21.02, 21.03, 21.04, 21.05, 21.06, and 21.07) from that 2010–11 adjudicative
23 proceeding?

24 A. Yes.

25 Q. Has any of your testimony from that 2010–11 adjudicative proceeding changed since then?

26 A. There have been changes in wind turbine design and size, and improvements in visual
27 assessment of wind turbine projects, including simulation technology, in the intervening
28 years. Therefore, if I were looking through fresh eyes today at this project as it was proposed
29 and approved in 2010–11, I believe my testimony would be modified. I would be more

1 critical of the assessment methods and findings.

2
3
4 Q. With your answer to the last question in mind, do you now readopt your written and oral
5 testimony from the 2010–11 Whistling Ridge adjudicative proceeding?

6 A. Yes. With the previous caveat.

7
8 Q. Have you recently reviewed the portions of the August 2011 Final Environmental Impact
9 Statement for the Whistling Ridge Energy Project pertaining to visual resources and
10 impacts?

11 A. Yes.

12
13 Q. Have you recently reviewed the Site Certification Agreement (“SCA”) for the Whistling
14 Ridge Energy Project issued by Governor Christine Gregoire on March 5, 2012?

15 A. Yes.

16
17 Q. Have you reviewed the September 13, 2023 filing by Whistling Ridge, Energy, LLC
18 (“WRE”) entitled “Whistling Ridge Energy LLC’s Request to Extend Term of Site
19 Certificate Agreement Pursuant to WAC 463-68-080” (hereinafter “Extension Request”)?

20 A. Yes.

21
22 Q. In Council Order No. 868, the Council held that “[t]he scenic and cultural heritage of the
23 Columbia Gorge is a state and regional asset warranting protection from visual harm
24 independent of the designation of portions of the territory as a National Scenic Area.” In
25 your professional opinion, do you agree with that Council holding?

26 A. Yes. I fully agree with that.

27
28 Q. In Council Order No. 868, the Council further held (with respect to the WREP) that “[w]ind
29 turbine generators should be excluded from portions of the site where they would be

1 prominently visible.” In your professional opinion, do you agree with that Council holding?

2 A. I do. However, some of the turbines that were approved, if they are built, would likely be
3 visually prominent. Removing the 15 turbines that were denied reduced turbine visibility
4 from the National Scenic Area and other important vantage points, but the remaining
5 turbines, if built, would likely still fail the Council’s test of “prominently visible.”

6
7 Q. If the Whistling Ridge Energy Project were constructed and operated as approved in the
8 SCA (*i.e.*, without any changes to the Project), would you anticipate that the adverse
9 environmental impacts discussed and disclosed in your prior testimony and in the FEIS
10 would occur?

11 A. My prior testimony was on the impacts of the 50 turbines originally proposed. I did not
12 testify regarding the approved 35-turbine Project, because this variation of the Project was
13 developed by the Council after my testimony. I suspect there could still be significant
14 adverse impacts from the 35-turbine approved Project, though less so than the original
15 proposal. As I noted in my prior answer, some of the impacts from the 35-turbine approved
16 Project would include turbines prominently visible from the National Scenic Area and other
17 vantage points. I would like to see an impacts analysis of the remaining turbines before
18 concluding the level of impact they would have.

19 Q. If the Whistling Ridge Energy Project were constructed and operated as approved in the
20 SCA (*i.e.*, without any changes to the Project), would you anticipate any additional or
21 different adverse impacts to scenic and cultural heritage resources, other than those
22 discussed and disclosed in your prior testimony and in the FEIS?

23 A. As stated above, building the Project as approved, with 35 turbines plus ancillary facilities,
24 could likely have significant adverse impacts, though less so than building the originally
25 proposed 50-turbine Project.

26 Q. In this matter, the State of Washington is required to consider “the short-term and long-term
27 environmental impacts of the proposal.” With your answers to the last two questions in
28 mind, what might be the short-term and long-term impacts to scenic and cultural heritage
29 resources of constructing and operating the Project as approved in the SCA (*i.e.*, without any
changes to the Project)?

A. Many of the approved 35 turbines appear to be prominently visible from designated key
viewing areas in the NSA. The distances they are viewed from, a few miles up to 10 miles,
are short enough that the visible turbines, under optimal conditions (clear skies, low haze,

1 side or back lighting) would likely be contrasting enough to rise to a high level of visual
2 impact. In other words, the impacts likely would not comply with the visual subordination
3 standard of the NSA (as well as the partial retention standard under U.S. Forest Service and
4 Bureau of Land Management methodologies) these standards are generally used to
5 distinguish lower levels of impact from higher levels of impact.

6 Q. With your answers to the last three questions in mind, if the Whistling Ridge Energy Project
7 were constructed and operated as approved in the SCA (*i.e.*, without any changes to the
8 Project), would you anticipate that this would result in any significant detrimental effect
9 upon the environment?

10 A. I believe the potential for significant detrimental effect is high. I believe an updated analysis
11 is necessary to conclude whether it is significant or not.

12 Q. In this matter, the State of Washington is required to exercise its police powers to protect the
13 public health, safety, and welfare. In terms of impacts to scenic and cultural heritage
14 resources, if this Project were constructed and operated as approved in 2012, how might that
15 affect the public welfare?

16 A. If the project turns out to have significant impacts to visual, scenic and cultural resources,
17 this can have impacts on public health and welfare. Just to provide one relevant definition,
18 the Council of Landscape Architecture Registration Boards defines “public welfare” in the
19 context of landscape architecture as “the stewardship of natural environments and of human
20 communities in order to enhance social, economic, psychological, cultural and physical
21 functioning, now and in the future.” Multiple studies show that scenic quality is related to
22 health. In particular, areas with poor scenic quality can cause high blood pressure, stress,
23 and subsequent health impacts. Based on research summarized in “The Science of
24 Scenery (2017),” Dr. Andrew Lothian showed how positive scenery promotes physical
25 and psychological health, by for example lowering stress levels and blood pressure, and
26 promoting a sense of well being.

27 Q. Applicable law requires WRE to disclose the nature and degree of any changes since March
28 5, 2012 to project-related environmental conditions. In your professional opinion, what sort
29 of information from WRE is necessary to comply with this requirement?

A. First, the height of the proposed turbines needs to be confirmed. Since the time of approval
in 2012, typical land-based turbines have gotten taller, and the blades longer. The heights of
the hubs have increased from around 260’ (average in 2010) to nearly 322’ (average in
2022) according to the U.S. Department of Energy, Office of Energy Efficiency and

1 Renewable Energy. Typical blade rotor diameter has increased from 380' to 430' over the
2 same time period. If the project were to include larger turbines than were approved, turbine
3 visibility will increase, as will the level of visual contrast. Turbines that may have been
4 barely visible, or not visible earlier, could be easily seen if they were 50 to 60 feet taller.
5 Additionally, new simulations that show the new design should be prepared, using state of
6 the art techniques. Blade motion is an important aspect of visual contrast, since movement is
7 known to draw attention. Simulations today often include "animations" from at least a few
8 viewpoints that show blades in motion. An updated visibility analysis should also be
9 required, especially if turbines taller than those envisioned years ago are now being
10 contemplated. Lastly, transporting longer turbine blades to the site could result in additional
11 visual impacts due to road construction, since longer blades require roads with greater turn
12 radius, resulting in larger cuts and fills, disturbance, and vegetation removal.

13 Q. Applicable law requires WRE to disclose the nature and degree of any changes since March
14 5, 2012 to statements and information in project-related environmental documents. In your
15 professional opinion, what sort of information from WRE is necessary to comply with this
16 requirement?

17 A. Height of turbines and blade rotor diameter, plus current and accurate details for all ancillary
18 facilities (such as roads, tree clearing, powerlines, any battery storage, etc.). As noted, longer
19 and wider turbine blades and components could result in larger road cuts and fills,
20 disturbance, and vegetation removal, all of which also has visual impacts.

21 Q. In your professional opinion, do you have any concerns with the fact that none of the plans,
22 specifications, surveys, studies, reports, disclosures, analyses, and proposed mitigation
23 measures for the Project and its impacts have been updated in at least 12 years (and for some
24 of these materials much longer than that)?

25 A. Yes, for the reasons stated above. Plus, even if the same size turbines as previously
26 approved were used, visual impact analysis methods are much better today than they were in
27 2011. An updated VIA is strongly recommended.

28 Q. In your professional opinion, before the State of Washington decides whether to extend the
29 term (duration) of the 2012 WREP SCA, should EFSEC first require from WRE updated
plans, specifications, surveys, studies, reports, disclosures, analyses, and proposed
mitigation measures for the Project and its impacts?

A. An updated analysis of visual impacts is highly recommended.

1 Q. At page 4 of the Extension Request, WRE pledges that “[i]n seeking this request, the
2 Applicant will utilize this time to . . . update environmental information and engage with
3 stakeholders.” In your professional opinion, should WRE follow through on these pledges
before the record is closed to public comments on the Extension Request?

4 A. It seems prudent to update the environmental information prior to extending a permit to
5 develop the site. Otherwise, the updated information might have no or very limited utility, if
6 such information were not made available until after a decision to extend the terms of the
7 permit as it was issued in 2012.

8 Q. Applicable law authorizes the Council to “retain an independent consultant, at the certificate
9 holder’s expense, to evaluate and make recommendations about whether changes to the site
10 certification agreement, regulatory permits, or project-related environmental documents are
11 necessary or appropriate. This work may include, but is not limited to, verification of
12 project-related environmental conditions, regulatory requirements, or appropriate
technology.” In your professional opinion, should the Council do so?

13 A. Yes. It is best to have a consultant who is answerable to the regulatory agency, not to the
14 developer, in order to obtain a neutral opinion of impacts.

15 Q. Applicable law requires WRE to disclose the nature and degree of any changes since March
16 5, 2012 to the project design for this Project. In your professional opinion, what sort of
17 information from WRE is necessary to comply with this requirement?

18 A. From a visual impact perspective, critical information includes: the size and design of the
19 proposed turbines, their proposed location, alternative locations, turbine numbering, roads,
20 vegetation clearing (short and long-term), proposed powerlines, battery storage units (if
21 proposed), and other ancillary features. An updated visibility analysis should be provided.
22 Updated simulations should be provided, including animations that show blade movement.

23 Q. The 2012 SCA allows up to 35 wind turbines, each at up to 430 feet tall to tip of blade. At
24 page 5 of the Extension Request, WRE discloses that a major purpose of the Extension
25 Request is to allow WRE “to review and if feasible to propose the installation of fewer but
26 taller wind turbine generators and associated facilities within the designated and approved
27 micro-siting corridors.” Does this disclosure provide enough information for you to evaluate
and provide meaningful comments on what types of changes to the Project are being
contemplated by WRE and the potential impacts of those changes?

28 A. The visual implications of taller turbines is important. Using taller turbines means they will
29

1 likely be more visible from important viewpoints, will extend visibility along corridors, will
2 be visible from places they would not be if shorter, and will be more visually dominant.
3 Greater visibility, more affected viewpoints, and greater dominance add up to higher
4 impacts. What may have been an acceptable level of impacts under a prior analysis may no
5 longer be in the acceptable range. Fewer turbines may partly compensate for taller ones, but
6 this is not a simple equation. It really does depend on multiple factors.

7 Q. Applicable law requires the State of Washington to consider “[w]hether any new
8 information or changed conditions indicate the existence of probable significant adverse
9 environmental impacts that were not covered in any project-related environmental
10 documents.” Does WRE’s disclosure in its Extension Request that it is contemplating
11 “fewer but taller wind turbine generators” constitute new information or changed conditions
12 that may indicate the existence of probable significant adverse environmental impacts of the
13 Project that were not covered in any project-related environmental documents?

14 A. It depends on how much taller the turbines will be. A few feet may not matter. Tens of feet
15 will likely matter. And change of locations can also matter quite a lot. Overall, this is
16 certainly new information, and since “taller turbines” probably means a lot taller, this could
17 indicate significant adverse environmental impacts that have not yet been analyzed or
18 reviewed.

19 Q. In order to fully evaluate the impacts of using “fewer but taller wind turbine generators,”
20 would you need more information about what types of changes to the Project are being
21 contemplated by WRE, such as the potential numbers, heights, and models of turbines that
22 WRE might wish to pursue?

23 A. Yes. As mentioned, the taller the turbines, the more likely they will be more visible and
24 more dominant from more viewpoints. Change in locations also can change visibility and
25 dominance.

26 Q. If WRE is unwilling and is not required to disclose any information about what types of
27 changes to the Project it is contemplating, can you tell us (and the Council) some of the
28 typical turbine heights that applicants and developers are now proposing for other wind
29 energy projects?

A. According to the U.S. Department of Energy, in 2010 the average hub height of land-based
wind turbines was 262’. In contrast, in 2022 the average height was 322’. Note this is hub
height, not blade tip height, which is much greater. Hub height is a better indicator of
visibility, visual contrast, and impact than blade tip height, because blades are thinner and

1 less visible than hubs. For the Horse Heaven Wind Project in Benton County, Washington,
2 Scout Energy is currently proposing turbines that would be 377' to 411' to the hub, and up
3 to 671' to the blade tip. If turbines of that height were used at the Whistling Ridge site, it
4 would represent an approximately 56% increase in height (from the 430' to the blade tip
5 approved in 2012 for Whistling Ridge). The applicant for the Summit Ridge Renewable
6 Energy Facility, in Wasco County, Oregon, proposes to build turbines that would be 381' to
7 the hub, and up to 648' to the blade tip. These heights are typical for modern wind energy
8 projects; every year, turbines get taller and blades get longer on average.

9 Q. How might the use of “fewer but taller wind turbine generators and associated facilities
10 within the designated and approved micrositing corridors” change the Project’s impacts to
11 scenic resources?

12 A. Fewer, taller turbines would likely result in greater visibility of some or all turbines from
13 important viewpoints and corridors. The visual dominance of individual turbines would
14 likely be greater. Fewer turbines may have the advantage of less visual overlap and density,
15 which happens when some turbines are seen behind others. But this would depend on how
16 many fewer turbines are built, and where the viewpoints are located.

17 Q. In Council Order No. 868, the Council held that “[w]hile [the approved turbine sites, up to
18 35 in number] may be partially visible from some viewing areas, and significantly visible
19 from a small number of locations, the [Project’s] overall visibility does not constitute an
20 undue distraction from or to the aesthetic and cultural values of the Gorge.” If wind turbines
21 taller than the approved 430 feet were used, how might taller turbines affect this Council
22 ruling?

23 A. As mentioned, taller turbines are more visible and more dominant. They may be visible
24 from more places in addition to those evaluated previously. I’m not sure what the phrase
25 “undue distraction” means. But I would say that if the turbines are visually dominant from
26 important viewpoints, then they are likely to cause significant impacts to visual resources.
27 And if they are much taller than previously approved, they are likely to be even more
28 dominant.

29 Q. If the Whistling Ridge Energy Project were constructed and operated with taller wind
turbines than were approved in 2012, would you anticipate that this would result in any
significant detrimental effects upon the environment?

A. Potentially, yes. It depends on how much taller, and on how many are built, and their
locations. I believe the risk of additional significant impacts is high.

1 Q. Other than the potential use of “fewer but taller wind turbine generators,” are you aware of
2 any other new information or changed conditions that may indicate the existence of probable
3 significant adverse environmental impacts of the Project that were not covered in any
project-related environmental documents?

4 A. I’m not. However, over the 12 years since the Project was approved, the heights, locations,
5 and patterns in surrounding and intervening vegetation may have changed enough to change
6 visual impacts. I would also add that battery storage is often a component of today’s wind
and solar projects, and battery storage facilities themselves can add more impacts.

7
8 Q. As a reminder (from a previous question), the State of Washington in this matter is required
9 to consider “the short-term and long-term environmental impacts of the proposal.” What
10 might be the short-term and long-term impacts to scenic and cultural heritage resources of
constructing and operating the Project with taller wind turbines than were approved in 2012?

11 A. Increased visibility, visual dominance, long-term visual impacts, plus greater short-term
12 impacts from clearing for wider roads to accommodate longer and wider turbine blades and
13 components.

14
15 Q. As a reminder (from a previous question), the State of Washington is required in this matter
16 to exercise its police powers to protect the public health, safety, and welfare. In terms of
17 impacts to scenic and cultural heritage resources, if the Project were constructed and
operated with taller wind turbines than were approved in 2012, how might that affect the
18 public welfare?

19 A. According to “The Science of Scenery” (Amazon, 2020), The public welfare/benefits of
20 conserving scenic resources include: health, life enhancement, sense of identity spirituality,
21 calming, stimulation of imagination and creativity, providing a “sense of place,” economic
development, tourism, enhanced property values, which enhance tax revenues, and
22 promotion of healing. All of this can be included under “public welfare.” To the extent to
which Washington conserves valued scenery, it protects these valued public benefits.

23
24 Q. In this matter, the State of Washington is required to consider “[r]easonable alternative
25 means by which the purpose of the proposal might be achieved.” Would you recommend
26 any reasonable alternatives (either to the design of the Project or to the Project itself) that
should be considered?

27 A. Recent technological improvements to Google Earth and GIS allow developers of wind
28 turbine projects, regulators, and communities concerned about impacts to easily and
29

1 inexpensively evaluate alternative site designs. Turbines, sized to the proposal, are located
2 using GPS coordinates and then simulated. Individual or strings of turbines can be added or
3 deleted and simulated as viewed from many viewpoints, quickly and efficiently. Lighting
4 conditions can be adjusted for time of day. These are not a substitute for “photo realistic”
5 images. But they are a very useful design tool that can result in alternatives that allow
6 communities and decision makers to evaluate and determine unacceptable versus acceptable
7 levels of impacts. I strongly urge EFSEC and the Governor to use tools like this before
8 deciding whether to extend further approval to this Project.

9 Q. Given that no plans, specifications, surveys, studies, reports, disclosures, analyses, and
10 proposed mitigation measures for the Project and its impacts have been submitted or
11 updated in more than twelve years, the pending Extension Request would extend the term of
12 the SCA for several more years beyond the original expiration date, and that the Extension
13 Request discloses that WRE intends to seek yet another extension even if the pending
14 Extension Request is approved, would you consider it a reasonable alternative to these
15 extension requests for WRE to instead file a new application for a new site certification
16 agreement?

17 A. I’m not familiar with all the regulatory or legal requirements. I can say that if the Project
18 approval is extended prior to further analysis of taller turbines, there is a high risk the
19 ultimate impacts will be greater than from the current Project as approved 12 years ago.

20 Q. Are your foregoing answers true and correct to the best of your knowledge and based on
21 your professional opinion?

22 A. Yes.

23 Q. If called as a witness for oral testimony in this matter, would you attest to the same answers
24 as given above?

25 A. Yes.

26 ///

27 ///

28 ///

29 ///

1 I declare under penalty of perjury that the foregoing is true and correct to the best of my
2 personal knowledge, information and belief.

3
4 Executed in Damascus, Oregon this 14th day of May, 2024.

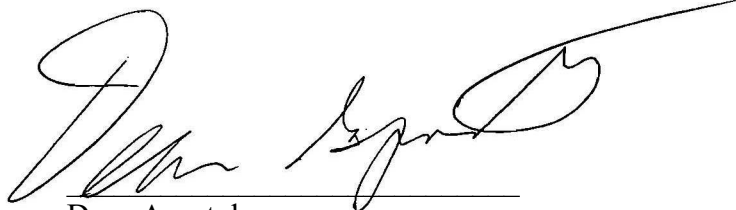
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29

Dean Apostol

Exhibit A

Dean Apostol

SCENIC RESOURCE CONSERVATION, NATURAL RESOURCE PLANNING

AREAS OF EXPERTISE Scenic Impact Analysis / Landscape Planning & Design / Restoration Ecology / Natural Resource Management / Environmental Analysis

Qualifications

Dean Apostol has over 40 years experience and broad expertise in scenic resource conservation, environmental impact assessment ecological restoration, natural resource planning, wildfire planning, and forest management. His experience includes 11 years as landscape architect for Mt Hood National Forest, 3 years for the Army Corps of Engineers and Bureau of Reclamation, and over 25 years in private practice, including with Moore, Icafino and Goltsman, and AECOM. Mr. Apostol's recent career has focused on scenic conservation and visual impact assessment for large scale renewable energy and transmission projects. He has served as an expert witness in the states of Washington, Oregon, and Montana for renewable energy projects. Additionally he has done Visual Impact Assessments for offshore wind project on the east coast of the USA.

In 1992 he published *Forest Landscape Analysis and Design* through the US Forest Service Pacific Northwest Experiment Station. This book applied theoretical concepts of landscape ecology to large scale forest planning and watershed analysis. Mr. Apostol has applied its principles to over a dozen projects internationally over the past two decades.

He published *Restoring the Pacific Northwest: The Art and Science of Ecological Restoration in Cascadia* (Island Press) in 2006. This is a leading text on the practice of ecological restoration in the Northwest region, from Washington State through Northern California and it remains in wide use. It includes chapters on restoration of old growth conifer forests, pine forests, oak woodlands, grasslands, and shrub steppe ecosystems. Mr. Apostol co-authored *Designing Sustainable Forest Landscapes*, by Taylor and Francis press (now Routledge) in 2008. He co-wrote *Restoring Temperate Forests, A North American Perspective* with Ayn Shlisky (in *Restoration Ecology, The New Frontier*, Island Press, 2012).

In 2016 Mr. Apostol was a part of an international team of experts that researched and wrote *The Renewable Energy Landscape* (Routledge Press, 2016), a book that proposed improved methods for managing the scenic impacts of large scale wind, solar, and energy transmission projects through appropriate regulatory and design strategies. This book is now used widely as a key reference on visual impacts of renewable energy.

Mr. Apostol continues to focus on natural resource based projects, including scenic resource conservation, forest management, wildfire mitigation strategies, open space planning, recreation design, trail design, landscape ecology, watershed analysis, and ecological restoration. He has done projects for: the US Forest Service, the National Park Service, Metro, City of Portland, Clackamas County, the Methow Valley Land Trust, ODOT, Friends of the Columbia Gorge, the Quinalt Indian Nation, Save Our Ridges, and many others. He has taught at Oregon State, and Portland State Universities, and taught an applied ecology for landscape architects class at University of Oregon in 2022. He also teaches applied ecology for environmental professionals through Half Moon Bay.

EDUCATION

Graduate Studies, Biogeography,
Portland State University 1989-1996

Bachelor of Science, Landscape Architecture,
Iowa State University 1977

REPRESENTATIVE PROJECTS

- Horse Heaven Hills Wind Farm, Washington State, Expert Witness Review
- California Department of Transportation Scenic Impact Assessment Handbook (for AECOM)
- Equinor Offshore Wind Energy Visual Impact Assessment, Federal waters off Nantucket (for AECOM)
- Mayflower Offshore Wind Energy Visual Impact Assessment, Federal waters off Nantucket (for AECOM)

- Obsidian Solar Energy Visual Impact Assessment Review, Christmas Valley OR
- Big Timber Montana Wind Energy Scenic Impact Review & Expert Witness Testimony, Livingston MT
- Virginia Ridge Forest Wildfire Mitigation Plan Scenic Impact Assessment, Methow Valley WA
- City of Portland Scenic Resources Protection Plan, Portland, OR
- PSE Eastside Transmission Line Visual Impact Review, Bellvue/Newcastle, WA
- Timberline Communications Site Visual Impact and Mitigation Analysis, Mt Hood National Forest
- Whistling Ridge Energy Project Scenic Impact review, Columbia River Gorge NSA
- Boardman to Hemingway Transmission Line Scenic Impact Review, Oregon EFSEC
- Cascade Crossing Transmission Line Scenic Impact Analysis, PGE
- San Luis to Pueblo Transmission Line Scenic Impact Review, Colorado
- Lower Owens River Recreation Plan, Inyo County CA
- Sites Reservoir Plan, Bureau of Reclamation (BOR), Maxwell, CA
- San Joaquin Gorge Reservoir Visual Impact Review, BOR CA
- Howard Hanson Dam Fish Passage Project, Army Corps of Engineers, Green River, Washington State
- Clackamas Wild & Scenic River Plan, Mt Hood National Forest
- Forest Park and Powell Butte Wildfire Risk Reduction Assessment, City of Portland (With Trout Mt Forestry)
- Tualatin Parks and Recreation Natural Resource Management Plan, THPRD (For MIG)
- Oregon Natural Resource Inventory and Stewardship Plan, Clatsop County, Oregon (With Trout Mt Forestry)
- Ecola Creek Forest Management Plan, Cannon Beach, Oregon (With Trout Mt Forestry)
- Siuslaw Watershed Assessment, Mapleton Oregon (with Ecotrust)
- Cispus Watershed Adaptive Management Area Plan, Gifford Pinchot National Forest
- Little Applegate River Watershed Landscape Plan, Siskiyou/Rogue River National Forest
- Colowash River Watershed Analysis and Design, Mt Hood National Forest

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29

BEFORE THE STATE OF WASHINGTON
ENERGY FACILITY SITE EVALUATION COUNCIL

In the Matter of Whistling Ridge Energy,
LLC's September 13, 2023 Request to
Extend the Term of the 2012 Site
Certification Agreement for the
Whistling Ridge Energy Project

DECLARATION OF K. SHAWN
SMALLWOOD, Ph.D.

I, SHAWN SMALLWOOD, make this Declaration based upon my personal knowledge and belief and declare as follows:

The following questions are from Friends of the Columbia Gorge and Save Our Scenic Area, and the answers are mine.

Q. Are you over the age of eighteen (18) and competent to testify in this matter?

A. Yes.

Q. Please state your name and address.

A. My name is K. Shawn Smallwood. My business address is 3108 Finch Street, Davis, CA.

Q. At whose request have you prepared this Declaration?

A. Friends of the Columbia Gorge and Save Our Scenic Area.

Q. What is your professional occupation, experience, and areas of expertise?

A. I am an Ecologist, having been conferred a Ph.D. degree in Ecology from the University of California at Davis in 1990. I perform research on animal density and distribution,

1 habitat selection, conservation of rare and endangered species, and interactions between
2 wildlife and human infrastructure and activities. I have performed research and
3 monitoring on renewable energy projects for 25 years, of which I authored numerous
4 peer-reviewed reports, papers, and book chapters on fatality searches and mortality
5 estimation, micro-siting to minimize collision mortality and other forms of mitigation, as
6 well as other issues related to biological impacts of wind energy generation. I served for
7 five years on the Alameda County Scientific Review Committee (SRC) that was charged
8 with overseeing measurement of impacts and mitigation efficacy in the Altamont Pass
9 Wind Resource Area (APWRA). I have prepared expert testimony on numerous proposed
10 renewable energy projects. I have collaborated with colleagues worldwide on the
11 underlying science and policy issues related to renewable energy impacts to wildlife.

12 Most of my field research on wildlife and wind energy was in the APWRA, which is
13 where much of the research funding had been directed to understand factors related to
14 wind turbine collisions and how to minimize or reduce them. The APWRA is the longest-
15 monitored wind resource area in the world for collision fatalities and relative abundance
16 and behaviors of affected species. In the APWRA, I have studied fatality estimation
17 methods, bird and bat behavior around wind turbines, and activity levels relative to
18 forage, terrain, season, time of night, and wind and weather conditions. I have studied
19 background mortality to ascertain the proportion of estimated mortality that can be
20 attributed to wind turbines. I studied the burrowing owl population throughout the
21 APWRA for nine years. I observed avian behavior during hundreds of hours of diurnal
22 visual-scan surveys over nine years. For 995 hours over seven years I observed wildlife at
23 night through a telephoto lens mounted on a thermal-imaging camera. Since 2013, I have
24 collaborated with a GPS telemetry study of golden eagles (ongoing). As part of the
25 repowering of the APWRA, I worked with a GIS analyst to micro-site wind turbines to
26 minimize impacts to raptors. I have provided guidance on the siting of new wind turbines
27 as part of the repowering of multiple wind projects to increase wind energy generation
28 while reducing collision mortality to particular species of birds.

29 I also collected and analyzed data from wildlife studies performed by others at many
wind and utility-scale solar projects. I have been involved with renewable energy impacts
on all fronts: study design, fieldwork on fatalities and use and behavior and ecological
relationships, study administration, hypothesis-testing, report-writing, presentations at
meetings, formulation of mitigation, micro-siting, study review, policy review and
decision-making, and public outreach. And I have worked on wind and wildlife issues for
county, state and federal government agencies, environmental organizations, consulting
firms, individuals, and wind companies. A copy of my current CV is attached to my
Declaration as Appendix 1.

Q. Are you familiar with the Whistling Ridge Energy Project (“WREP” or “Project”)?

A. Yes.

1 Q. Did you testify as an expert witness for Friends of the Columbia Gorge and Save Our Scenic
2 Area in the 2010–2011 adjudicative proceeding for the Whistling Ridge Energy Project
3 conducted by the Washington Energy Facility Site Evaluation Council (“EFSC”)?

4 A. Yes.

5
6 Q. Have you recently reviewed your written and oral testimony and exhibits (Exhibits 22.00,
7 22.00E, 22.00r, 22.01, 22.02, 22.03, and 22.04) from that 2010–11 adjudicative proceeding?

8 A. Yes.

9
10 Q. Has any of your testimony from that 2010–11 adjudicative proceeding changed since then?

11 A. After another 13 to 14 years of experience with the issues of wind energy and wildlife since
12 my 2010 testimony, my testimony must change. For each issue I addressed in my original
13 testimony, I have since collected much more data and developed a much more robust
14 understanding, including the following:

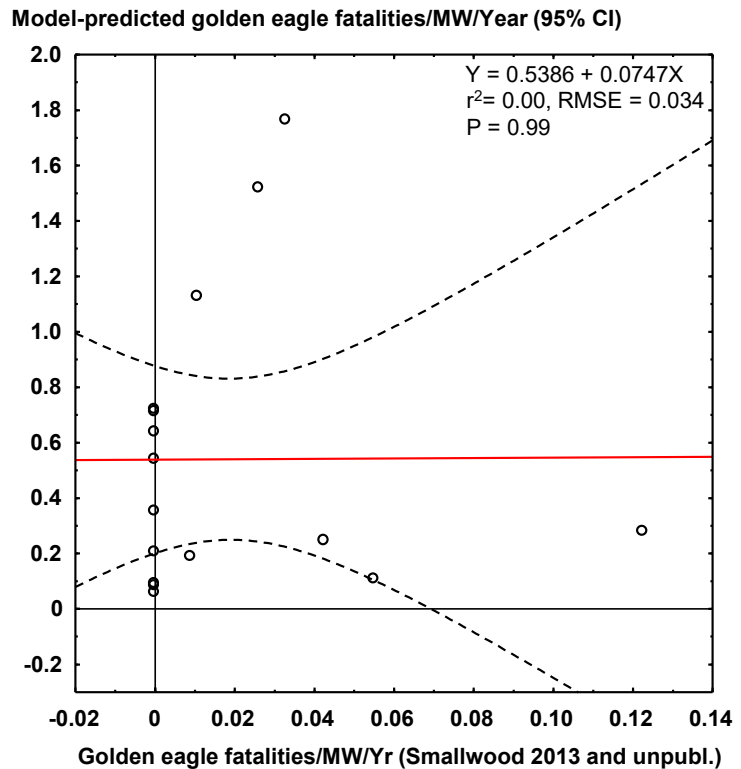
- 15 1. I originally challenged the metrics used to predict collision mortality based on a model
16 of fatality rates regressed on utilization rates, comparisons of exposure index values
17 among species seen at the site, and a comparison of raptor nest density to nesting
18 densities at other wind project sites (It turned out that nest density was not specifically
19 used at Whistling Ridge, but had been used to predict mortality elsewhere). In the last
20 14 years, however, I have been able to collect more predictions for direct comparison to
21 outcomes. It turns out that utilization rates are generally poor predictors of mortality,
though there has to be some utilization in order for mortality to occur. The problem with
utilization rates is that they are difficult to accurately measure, and utilization rates often
fail to include sufficient detections of each species to support accurate predictions of
mortality (Smallwood 2017).

22 Similarly, the exposure index was a poor predictor of wind turbine collision mortality,
23 and no evidence was ever presented that it could accurately predict mortality. After
24 having accumulated sufficient data from baseline studies and post-construction fatality
25 studies, I tested for a relationship between mortality and the exposure index and found
no predictive relationship (Smallwood and Neher 2017). I should note here that WEST
stopped reporting exposure index values years ago, as far as I can determine.

- 26 2. In the years since my 2020 testimony, I have tested for relationships between fatality
27 rates and use rates, and I have further examined the factors that affect use rates, such as
28 survey duration, maximum survey radius, and terrain settings (Smallwood and Neher
29 2017, Smallwood et al. 2017). And I have tested the prediction accuracy of the U.S. Fish

1 and Wildlife Service's (USFWS's) Bayesian model for predicting collision mortality
2 from use rates. It turns out that the USFWS model is unable to accurately predict golden
3 eagle mortality among wind projects where baseline studies provided the data to predict
4 mortality (Figure 1), nor was it able to predict mortality—even within the APWRA,
5 where use rates and mortality were measured concurrently.

6 **Figure 1.** *The USFWS's Bayesian model-predicted golden eagle fatality rate
7 predictions regressed on golden eagle fatality rate estimates that I adjusted
8 for comparability from among publicly available reports from wind
9 projects included in Bay et al. (2016).*



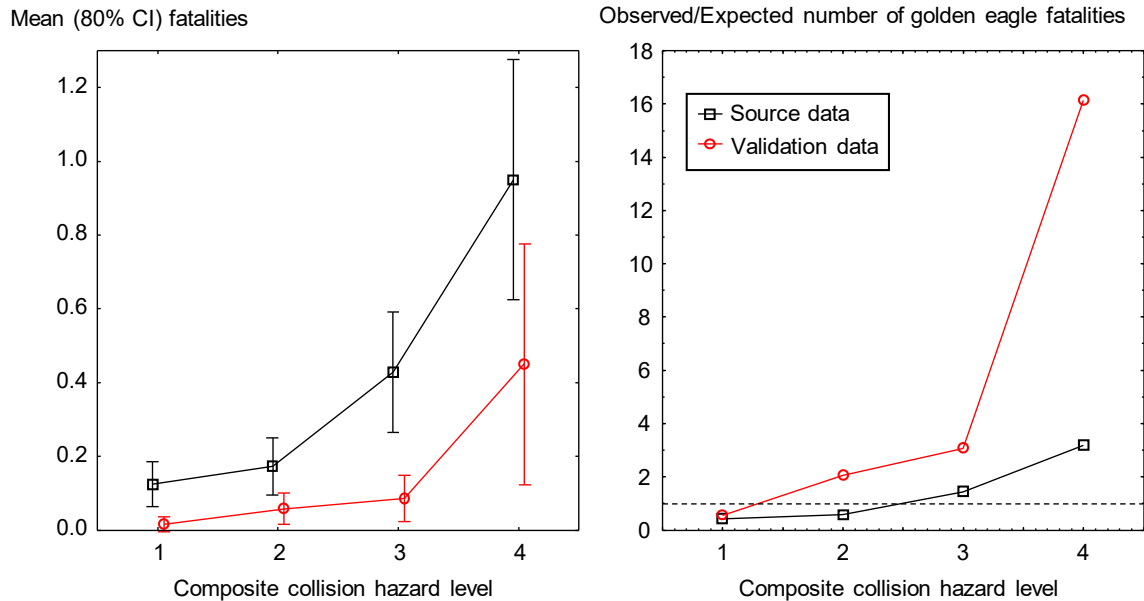
15
16
17
18 3. I have developed a new, more accurate approach to estimating collision mortality,
19 known as integrated detection trials for overall detection rates, D (Smallwood et al.
20 2018). In doing so, I discovered large sources of bias in existing mortality estimates.
21 One of these biases includes the use of carcasses in carcass detection trials that are larger
22 than the animals found as fatalities, thereby biasing mortality estimates low. Another is
23 the implementation of maximum fatality search radii that are too short to include all of
24 the fatalities deposited by a wind turbine. I also discovered multiple sources of error
25 resulting from carcass detection trials that inform too many adjustment terms and which
26 perpetuate poor field methods that unrealistically represent the conditions under which
27 collision fatalities occur and carcasses are deposited and eventually exposed to fatality
28 searchers. I also discovered through the use of scent-detection dogs leashed to skilled
29 handlers that human searchers find only small proportions of fatalities of bats and small
birds, which means that most mortality estimates of bats and small birds are biased low
and omit multiple species that were killed by wind turbines but not found by the fatality
searchers (Smallwood et al. 2020).

4. I have strengthened my understanding of certain collision mortality adjustments that I

1 mentioned in my original testimony. One example is the use of mean days to carcass
2 removal as a means to estimate carcass persistence, especially when mean days to
3 carcass removal is measured in detection trials that last longer than the fatality search
4 interval. Another is the substantial effect of fatality search interval (Smallwood 2017).
5 And rather than speculating on the effect of crippling bias, I have now measured it for
6 golden eagles (K. S. Smallwood, unpublished data).

- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14
- 15
- 16
- 17
- 18
- 19
- 20
- 21
- 22
- 23
- 24
- 25
- 26
- 27
- 28
- 29
5. I have discovered that much of the collision risk to some species is the wind turbine structure, rather than its moving rotor blades (Smallwood and Bell 2020a). I established that inoperative wind turbines are more hazardous than operative turbines to red-tailed hawks, burrowing owls and other species (Smallwood and Bell 2020a). For bats on the other hand, collision risk is eliminated while wind turbines are inoperative (Smallwood and Bell 2020a,b).
 6. The average numbers of fatalities I predicted at Whistling Ridge (Table 3 in my original testimony), based on fatality estimates reported elsewhere in Washington, Oregon and California would increase. Based on advances in fatality estimation, my prediction of mortality must increase. Furthermore, I now have access to collision mortality estimates based on studies at wind projects in forested environments (see below). The estimates from forested environments provide further evidence that mortality at Whistling Ridge would be much higher than earlier predicted.
 7. Whereas in my original testimony I referred to wild turkey as “exotic” (pp 23-24), biologists have since determined that wild turkey populations used to occur in the western states. This means that all of the vertebrate wildlife species detected by WEST during its surveys were more or less endemic, and therefore site invasibility by wildlife was zero and ecological integrity was very high.
 8. Bat mortality caused by wind turbines is much higher than was understood in 2010–2011 (p. 25, my original testimony).
 9. Following up on my original testimony on p. 26, I have since compared Partners In Flight’s prediction of population size to what I measured of the loggerhead shrike population within the Altamont Pass Wind Resource Area (APWRA) (Smallwood and Smallwood 2021). As I predicted in my original testimony, the PIF model is inaccurate. In this case it under-predicted the number of loggerhead shrikes.
 10. My estimates of cumulative collision mortality in Washington would be much higher today than I estimated on p. 28 of my original testimony.
 11. In my original testimony on p. 30, I was asked whether I had “researched and analyzed the relative impacts of wind energy projects when constructed at forested sites versus other settings.” I have since estimated fatalities of wind projects in forested environments, which I found to be very high (see below).

1 12. The micro-siting efforts I discussed on pp. 32–33 of my original testimony were since
2 completed, and the approach I described was highly effective at minimizing collision
3 mortality to golden eagle (Figure 2) and burrowing owl. I was able to measure efficacy
4 of my micro-siting recommendations because the wind company that owns two of the
5 projects did not always follow my recommendations. My conclusions that the approach
6 was successful was indicative of an improved understanding of causal factors.



7
8
9
10
11
12
13
14
15
16 **Figure 2.** Mean golden eagle fatalities (left) and Observed/Expected number of
17 fatalities (right) among wind turbines by collision hazard level at Golden Hills and
18 Golden Hills North Wind Projects in the APWRA, where the source data used to develop
19 the combined collision hazard levels are depicted in black and the validation data are
20 depicted in red, and where collision hazard ranged from the low of 1 to the high of 4.

21 13. After having witnessed construction of modern wind turbines on complex terrain, I
22 would reconsider my original testimony on habitat impacts to include habitat loss caused
23 by construction grading. The grading needed to construct roads and to prepare slopes for
24 the construction of modern wind turbines is extensive (Photo 1).
25
26
27
28
29

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29



***Photo 1.** Construction grading for a repowered wind project destroyed every ground squirrel burrow complex encountered, which also diminished breeding opportunities for burrowing owls and forage for golden eagles, September 2019. This view includes only two wind turbine pads; the rest of the grading was for access roads.*

Construction grading needed to accommodate large, modern wind turbines also results in extensive long-term loss of vegetation cover, even after efforts to restore vegetation (Photo 2). This loss of vegetation results in loss and degradation of wildlife habitat.



Photo 2. *Effects of grading on vegetation cover in the APWRA, 5 years, 8 years, and 16 years following construction and efforts at revegetation. Yellow arrows point to graded areas visible in February 2020 Google Earth imagery where vegetation has yet to return to normal composition and density.*

Construction grading needed for modern wind turbines also results in soil erosion, which typically originates at access roads and wind turbine laydown areas (Photos 3 and 4). Erosion can result in wildlife habitat loss and habitat fragmentation. Having witnessed all of the effects illustrated in Photos 1 through 4, I would have to modify my original testimony to include a discussion of these effects.

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29



Photos 3 and 4. Soil erosion in wind projects often originates at the corners of turbine pads (top) or on cut slopes (bottom)

14. I would also testify to wildlife-automobile collision mortality that occurs on wind turbine access roads. Beginning in late 2016 and extending through 2019, I recorded wildlife fatalities I found on wind turbine access roads far enough away from wind turbines to rule out wind turbine collision as the mortality source. I documented 25 road-collision fatalities, including of desert cottontails, striped skunk, California ground squirrels, California voles, gopher snakes and western Pacific rattlesnakes.

15. I would testify to potential impacts to more special-status species, as more species

1 appear to have special-status than occurred at the time of the EIS. Occurrence records in
2 the project area (i.e., the area around the project that is close enough to warrant
3 investigation of the occurrence likelihood of the species on the project site) of special-
4 status species that were not considered in the EIS include black swift, Calliope
5 hummingbird, rufous hummingbird, American white pelican, northern harrier,
6 flammulated owl, Lewis's woodpecker, white-headed woodpecker, common nighthawk,
7 long-billed curlew, evening grosbeak, Cassin's finch, Hoary bat, pallid bat, silver-haired
8 bat, gray wolf, Oregon spotted frog, Oregon slender salamander, and western pond turtle
9 (also known as northwestern pond turtle and Pacific pond turtle).

10 I would add that western gray squirrel or its habitat is likely found within the project
11 site, which is significant because since the FEIS was circulated, the State of Washington
12 elevated the listing status of this species from state threatened to state endangered.
13 Western gray squirrel habitat is certainly available on the project site, and Johnson et al.
14 (2009: Table 8) reportedly encountered a "gray squirrel (*Sciurus* sp.)" on the project site
15 during its wildlife surveys on the site in 2009. Johnson et al. (2009) added the caveat
16 that the gray squirrel might have been an eastern gray squirrel. However, although there
17 exist a few records of eastern gray squirrel in the City of Hood River, Oregon, the
18 environment of the project site, along with its high ecological integrity, is not the type of
19 environment where eastern gray squirrel would be found (Smallwood 1994).

20 16. I would add quantitative analysis to my testimony regarding the insufficiency of avian
21 use surveys.

22 Q. With your answer to the last question in mind, do you now readopt your written and oral
23 testimony from the 2010–11 Whistling Ridge adjudicative proceeding?

24 A. Yes. My conclusions in my 2010–2011 testimony have only been strengthened by additional
25 research experience.

26 Q. Have you recently reviewed the portions of the August 2011 Final Environmental Impact
27 Statement for the Whistling Ridge Energy Project pertaining to wildlife resources and
28 impacts?

29 A. Yes. I disagreed with many of the conclusions in the FEIS when I first reviewed. I continue
to disagree with the same conclusions, but I also find much of the content, including
analyses and conclusions, obsolete.

Q. Have you recently reviewed the Site Certification Agreement ("SCA") for the Whistling

1 Ridge Energy Project issued by Governor Christine Gregoire on March 5, 2012?

2 A. Yes.

3
4
5 Q. Have you reviewed the September 13, 2023 filing by Whistling Ridge, Energy, LLC
6 (“WRE”) entitled “Whistling Ridge Energy LLC’s Request to Extend Term of Site
7 Certificate Agreement Pursuant to WAC 463-68-080” (hereinafter “Extension Request”)?

8 A. Yes.

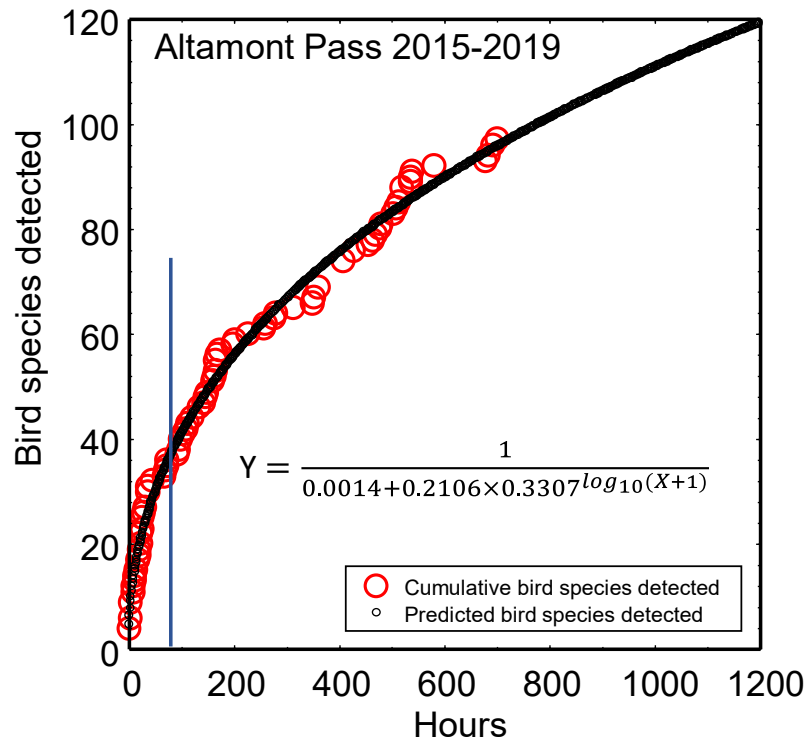
9 Q. In Council Order No. 868, the Council found that “[t]he Project is among the first four wind
10 energy generation projects to be seriously proposed in a Northwest forest habitat.” Do you
11 agree with that Council finding?

12 A. Yes.

13
14 Q. In Council Order No. 868, the Council found that “[t]he [WREP] site is habitat for more
15 than 90 species of birds, including sensitive species, and to bats.” Do you agree with that
16 Council finding?

17 A. Yes. The FEIS reports 87 species of birds were detected on the project site, but there are
18 many more species than the number that the FEIS reports. Since my original testimony, I
19 quantified the rate of new species detections with increasing survey time (Figure 3). After
20 87 hours of survey, which was the cumulative survey time committed to Whistling Ridge
21 by the time of my testimony, WEST had detected 87 species of birds, whereas in the
22 APWRA I had detected 38 species of birds over the same number of hours of diurnal
23 visual-scan surveys I completed between 2015 and 219. These 38 species composed
24 39.58% of the number of species I detected in the APWRA after 702 hours of survey.
25 Treating my APWRA surveys as an analytical bridge, another 600+ hours of surveys could
26 increase the number of bird species to at least $87/0.3958 = 220$ species of birds at the
27 Whistling Ridge site.
28
29

Figure 3. Cumulative bird species detections increased toward an unrealized asymptote of 714 species with increasing number of hours of visual-scan surveys in the APWRA, 2015–2019. The blue vertical line represents the number of species I detected by 87 hours (the survey effort previously performed by WEST at the Whistling Ridge site).



Q. In Council Order No. 868, the Council found that “[b]oth [birds and bats] rely on flight for principal mobility and both may collide with rotor blades or be caught in pressure changes in the vortex of revolving rotors,” and “[h]azards to flying species (birds and bats) have been found to include striking or being struck by turbine blades and becoming disoriented or injured by the vortex of moving blades” Do you agree with these Council findings?

A. Yes. I have personally witnessed birds and bats struck by turbine blades, birds colliding with non-moving portions of wind turbines, and bats caught in the pressure vortices that trail blades of operative wind turbines. I have also witnessed birds and bats tumbled by wake turbulence of operative turbines. I have personally found birds and bats, both dead and alive but mortally injured, under or near the rotors of wind turbines. I have thousands of photos of such injuries caused to birds and bats due to collisions with wind turbines.

Q. In Council Order No. 868, the Council held that “[a]dditional study [at the WREP site] appears to be appropriate for bats as well as birds.” Do you agree with this Council holding?

A. Yes. For wind energy projects, it has become my opinion that collision mortality of bats is of greater concern than collision mortality of birds. Bats are long-lived animals with low reproductive rates, otherwise known as k-selected species. Bats are also very important ecologically and economically (Boyles et al. 2011). Bats consume large numbers of insects,

1 and bats are also important pollinators.

2
3
4 Q. In Council Order No. 868, the Council held that “an abundance [wildlife] survey and a
5 literature review (noted by Audubon) may have been helpful.” Would you recommend
6 requiring either of these items now for the Whistling Ridge Energy Project?

7 A. Yes, I would recommend both. The majority of all scientific literature addressing wildlife
8 and wind energy has been published since my 2010–2011 testimony, as most of the research
9 and most of the mortality measurement has taken place since then. An abundance survey is
10 needed because the original use surveys were insufficient and were completed some 20
11 years ago.

12 Q. In Council Order No. 868, the Council held for the WREP that “[m]icrositing prior to tower
13 construction, considering avian and bat flight patterns as well as feeding and nesting areas[,]
14 will be required to optimize tower locations to minimize injuries to flying creatures.” In your
15 professional opinion, how important is this micrositing process as required by the Council?

16 A. Other than smart curtailment to reduce bat collision mortality, no mitigation measure has
17 proven more effective than careful siting of wind turbines to minimize collision mortality.

18 Q. With your answer to the last question in mind, in your professional opinion will it be
19 important for interested persons to be given opportunities and rights to participate in
20 EFSEC’s review of this micrositing process?

21 A. Yes, because in my experience the micro-siting process only works when there is public
22 participation resulting in public oversight. During my first micro-siting job that actually
23 resulted in built wind turbines, there was considerable public interest and public scrutiny of
24 the micro-siting process. The wind company had to regularly report our progress to the
25 Alameda County Scientific Review Committee. The company followed my
26 recommendations. In repowering jobs where public scrutiny was lacking, the wind company
27—in my opinion—did not follow all of my recommendations, and in one repowering project
28 far removed from the eyes of the public, that same company followed none of my
29 recommendations, in my assessment. Although I had been told by the company that all of
my recommendations were followed, by examining Google Earth imagery I later
determined that all of the project’s wind turbines had instead been built in the same locations
where the company had originally planned them. The company later pled guilty to violations
of the Migratory Bird Treaty Act in litigation brought by the U.S. Department of Justice.
The violations involved golden eagles killed by wind turbines at multiple projects, including
the project where my recommendations were not followed.

1
2
3 Q. Council Order No. 868 discusses a “mitigation parcel” that was offered by WRE as
4 mitigation for the Project, and in one place states that “[t]his mitigation parcel . . . has yet to
5 be offered as a formal mitigation plan” and “[d]ue to that fact, this Order does not address
6 the mitigation parcel in the findings of Fact & Law,” however in Finding of Fact and
7 Conclusion of Law No. 29, the same Order states that “the mitigation parcel discussed in the
8 record is appropriate and may be accepted.” In your professional opinion, does it concern
9 you that the Order is internally inconsistent as to whether this parcel has been accepted as
10 mitigation for any unavoidable impacts to wildlife caused by the Project?

11 A. Yes. In my experience with the wind industry, unclear statements of mitigation often
12 resulted in the mitigation being insufficiently implemented or not being implemented at all
13 (Smallwood 2008). When I was a member of the Alameda County SRC, I ended up keeping
14 a log of the schedule of required mitigation measures and what actually transpired, and I did
15 so because most of the required measures were not implemented on time or ever. Unclear
16 wording was typically exploited. To provide an anecdotal example, the mitigation language
17 for the APWRA required all “derelict” wind turbines to be removed from the APWRA by a
18 certain date. We used the term “derelict” in the mitigation language because our discussions
19 in the presence of the wind companies had used that term to refer to broken, inoperative
20 wind turbines and wind turbine towers that no longer supported wind turbines. The wind
21 companies ignored the mitigation measure, and when the SRC later challenged them on
22 their lack of action, the companies explained that their term for the same types of structures
23 was “vacant towers.” Because the companies did not acknowledge “derelict turbines” as an
24 operative term of their industry, they felt justified in ignoring the measure that called for the
25 removal of these structures.

26 Q. Council Order No. 868 requires for the WREP “[d]evelopment and compliance with best
27 management practices, including the possibility of minimizing operations such as low rotor
28 speed that may present greater hazards to some species.” In your professional opinion, how
29 should this requirement be implemented?

A. There should be a commitment to some form of operational curtailment to minimize impacts
to bats. To decide which form of curtailment needs to be implemented, bat surveys using
acoustic detectors and thermal-imaging cameras are needed to ascertain how bats use the
aerosphere of the project site. To what degree are any of the bats migrating through the
project area? To what degree are they foraging on the project site, and where are they
foraging? Are they foraging in small groups? The activity periods also need to be learned,
such as times of night and seasons of the year when bats are active.

1 Q. If the Whistling Ridge Energy Project were constructed and operated as approved in the
2 SCA (*i.e.*, without any changes to the Project), would you anticipate that the adverse
3 environmental impacts discussed and disclosed in your prior testimony and in the FEIS
4 would occur?

5 A. Yes, but at greater magnitudes than I had originally predicted. At the time of my original
6 testimony, there was little to no experience with wind turbines operating in forested
7 environments. Whereas I suspected collision mortality of birds and bats would be higher in
8 forested environments, I lacked evidence in support of my suspicion. Since my original
9 testimony was prepared in 2010–2011, multiple wind projects have been developed in
10 forested environments. I reviewed and reanalyzed the data from these projects. However,
11 before I present what I found, I need to briefly explain how I reanalyzed the data.

12 Based on reexamination of collision fatality data that had been reported through 2014, I
13 found a major difference in bat mortality estimates depending on whether the fatality
14 searcher interval was shorter or longer than 10 days (Smallwood 2020). I found that
15 mortality of bats was much higher with shorter search intervals, averaging 19.69 (95% CI:
16 11.486–28.989). (Mortality estimates based on longer search intervals averaged 4.083, 95%
17 CI: 0.407–8.342.) Although I warned in my 2010 testimony that my predicted bat mortality
18 at the Whistling Ridge site was based on an average of reported fatality rates that needed
19 adjustments for emerging estimation biases, my later finding of 19.69 bat fatalities/MW/year
20 far exceeds the prediction I anticipated in 2010. However, most of the fatality data that
21 contributed to my average bat mortality reported in Smallwood (2020) were collected from
22 wind projects that were not located in forested environments like the Whistling Ridge site.

23 In the time I had available to prepare this new testimony, I reexamined avian and bat fatality
24 data from wind projects located in wooded or forested environments, as well as a couple of
25 projects on areas of cropland and pasture that were surrounded by forests. The data varied in
26 quality due to variation in study design. I had to make some large adjustments to the fatality
27 rates to account for grossly insufficient maximum fatality search radii around wind turbines,
28 and for the use of carcasses in carcass detection trials that were much larger than the
29 carcasses of birds and bats that were found in fatality searches.

To adjust fatality rates for insufficient search radius, I first adjusted Hull and Muir’s (2010)
recommended search radii based on turbine tower height and their modeling of carcass fall-
ballistics. Using leashed scent-detection dogs in fatality searches, my colleagues and I found
patterns of carcass deposition around wind turbines that are as close to true ever found
(Smallwood et al. 2020). I used these patterns of carcass deposition to adjust the Hull and
Muir (2010) recommendations to account for the proportions of bird and bat carcasses that
we found beyond the distances predicted by Hull and Muir (2010). For birds and then bats, I
multiplied the fatality count in each study to the ratio of carcasses Smallwood et al. (2020)
found at distances that corresponded with each study’s maximum search radius to the
adjusted Hull and Muir (2010) recommended maximum search radius:

1
2

$$\hat{F} = F \times \frac{f_r}{f_R},$$

3 where the adjusted fatalities \hat{F} is the product of the number of fatalities reported at a
4 particular project and the ratio of the number of fatalities that Smallwood et al.'s (2020)
5 leashed scent-detection dogs found within the distance from the turbines that corresponded
6 with the project's maximum search radius, f_r , and that corresponded with the distance from
7 the turbines that Hull and Muir (2010) recommended (and which I adjusted), f_R . Because
8 Smallwood et al. (2020) did not search as far as the adjusted Hull & Muir (2010)
9 recommend distances from the turbines, I modeled the cumulative number of fatalities
10 found with increasing distance from the turbine, and predicted the number of carcasses that
11 leashed scent-detection dogs would have found at the greater distances from the turbines.

12 The use of carcasses to represent broad size classes, such as Japanese quail used to represent
13 birds the sizes of hummingbirds, warblers, kinglets, thrushes and other small birds typical of
14 forested environments, misrepresented the carcass detection probabilities typical of these
15 smaller birds, and therefore biased fatality estimates low. I sought to mitigate this bias based
16 on research of carcass detection probabilities (Smallwood et al. 2018). In this research, I
17 placed carcasses of birds and bats that varied greatly in body mass, whereby I integrated the
18 placements into routine fatality monitoring at a wind project, and I treated the placed
19 carcasses as if they were wind turbine collision victims. The placed carcasses were left
20 where placed indefinitely, giving fatality searchers, who were blind to the trials, multiple
21 opportunities to detect the carcasses unless a scavenger removed them first. The trial
22 outcome for each carcass was that it was either found or not found. I logit-regressed trial
23 outcomes on carcass body mass to explain most of the variation in trial outcomes, and to
24 derive a highly predictive adjustment factor for placed carcasses in detection trials.

25 The wind projects for which I reexamined fatality data are listed in the Table below, and
26 their references follow the Table. They averaged 40 bat and 22 bird collision fatalities per
27 MW per year. (The estimates from the Quality Wind project in British Columbia are
28 suspiciously very low, perhaps partly due to its very short 50-m maximum search radius.)
29 The forested wind projects in the USA averaged nearly 69 bat and 29 bird collision fatalities
per MW per year, which are much higher fatality rates than I could have contemplated at the
time of my 2010 testimony. Applying these rates to the 75-MW Whistling Ridge Energy
Project would predict 5,171 bat fatalities and 2,153 bird fatalities per year, and these
numbers are predicted without any further adjustment of the underlying fatality rates for the
duration of fatality searches lasting less than one year. Two of these estimates are derived
from fatality studies that lasted only half a year. Whether my predicted mortality of bats and
birds are accurate or still too low, the Whistling Ridge Wind Energy Project would kill
thousands of bats and birds per year. And what the Table does not show is the much greater
numbers of species affected than typically reported at non-forested wind energy projects in
Washington and Oregon.

Project	Environment	Years of searches	Fatalities per MW per year	
			All bats	All birds
McAvoy Ranch	Woodland	1.8	17.42	24.56
Wolfe Island, Ontario	Croplands & pasture surrounded by forest	1	31.52	28.15
Heritage Gardens, Michigan	Croplands & pasture surrounded by forest	0.438	23.52	14.48
Quality Wind, British Columbia	Forested	0.537	2.14	2.34
Buffalo Mountain, Tennessee	Forested	0.833	157.45	71.19
Beech Ridge, West Virginia	Forested	0.5833	24.34	11.15
Antrim Wind, New Hampshire	Forested	0.5	24.72	3.79
Mean	All projects		40.16	22.24
Mean	Forested in USA		68.84	28.71

Table references:

Fiedler, J. K. 2004. Assessment of bat mortality and activity at Buffalo Mountain Wind Farm, Eastern Tennessee. Thesis, University of Tennessee, Knoxville, Tennessee.

Hemmera. 2014. Quality wind project – bird and bat monitoring 2014 annual report. Report to Capital Power Corporation, Edmonton, Alberta.

Kerlinger, P., J. Guarnaccia, R. Curry, C. J. Vogel, and D. Riser-Espinoza. 2013. 2013 post-construction bird and bat fatality study Heritage Garden Wind Farm, Delta County, Michigan. Report to Heritage Sustainable Energy, LLC

Kerlinger, P., J. Guarnaccia, R. Curry, and C. J. Vogel. 2014. Bird and bat fatality study Heritage Garden I Wind Farm, Delta County, Michigan – 2012–2014. Report to Heritage Sustainable Energy, LLC

Nicholson, C. P. 2003. Buffalo Mountain Windfarm bird and bat mortality monitoring report: October, 2001–September, 2002. Report to Tennessee Valley Authority, Knoxville, Tennessee.

Point Blue Conservation Science. 2014. Assessing bird and bat mortality at the McEvoy Ranch wind turbine in Marin County, California 2009–2012. Point Blue Contribution No. 1984.

Stantec Consulting. 2011. Wolfe Island Ecopower Centre Post-Construction Follow-up Plan: Bird and Bat Resources Monitoring Report No. 3, January–June, 2010. Report to TransAlta Corporation’s wholly own subsidiary: Canadian Renewable Energy Corporation.

1 Stantec. 2020. Post-construction monitoring report year 1, Antrim Wind Project, 2020.
2 Report to Antrim Wind Energy, LLC, Portsmouth, NH.

3 Tidhar, D., M. Sonnenberg, and D. Young (WEST). 2013. 2012 Post-construction carcass
4 monitoring study for the Beech Ridge Wind Farm, Greenbrier County, West Virginia.
5 Report to Beech Ridge Energy, LLC, Chicago, IL.

6 Q. If the Whistling Ridge Energy Project were constructed and operated as approved in the
7 SCA (*i.e.*, without any changes to the Project), would you anticipate any additional or
8 different adverse impacts to wildlife resources, other than those discussed and disclosed in
9 your prior testimony and in the FEIS?

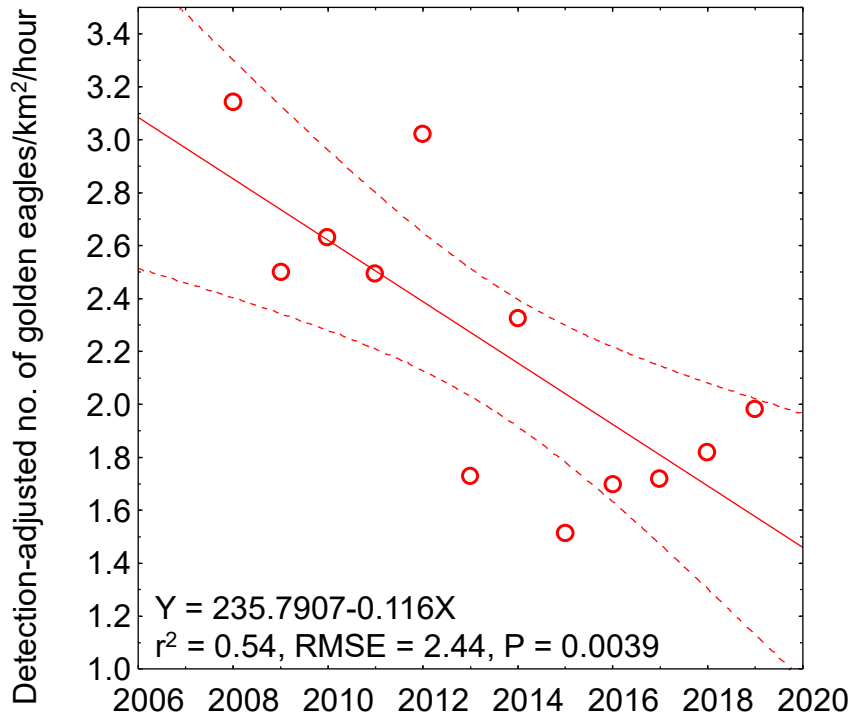
10 A. Yes. There would be higher degrees of habitat loss, much higher wind turbine collision
11 mortality to birds and bats, and there would also be wildlife-automobile collision mortality
12 on access roads, as I testified earlier herein.

13 Q. In this matter, the State of Washington is required to consider “the short-term and long-term
14 environmental impacts of the proposal.” With your answers to the last two questions in
15 mind, what might be the short-term and long-term impacts to wildlife resources of
16 constructing and operating the Project as approved in the SCA (*i.e.*, without any changes to
17 the Project)?

18 A. Short-term effects would include habitat loss and habitat degradation due to construction
19 grading for access roads and turbine laydown areas. Long-term effects would result from
20 chronic mortality caused by bird and bat collisions with the wind turbines. In the APWRA,
21 members of breeding pairs of golden eagles have increasingly been found to consist of
22 subadults, which are thought to be less capable of parenting nestlings (Wiens and Kolar
23 2021). At the same time, I documented a 45% decline of golden eagles in the APWRA
24 (Figure 4). I also documented a 45% decline of burrowing owls over the last decade of my
25 research in the APWRA.

26
27
28
29
Another long-term impact is likely to be social and political. Where wildlife have been
found to be adversely affected by wind energy, the impacts have been controversial.
Litigation has ensued in the APWRA, along with endless hearings and meetings.

1 **Figure 4.** Mean annual
 2 *detection-adjusted counts*
 3 *of golden eagles/km²/hour*
 4 *among studies in the*
 5 *Altamont Pass Wind*
 6 *Resource Area,*
 7 *California, from 2008*
 8 *through 2019, including*
 9 *30-minute visual scans*
 10 *performed by the*
 11 *Alameda County monitor*
 12 *for the SRC, at Buena*
 13 *Vista and Vasco Winds*
 14 *repowering projects, and*
 15 *in the Ogin Study, and 60-*
 16 *minute visual scans at*
 17 *Patterson Pass and*
 18 *APWRA-wide as part of*
 19 *the NextEra mitigation*
 20 *study.*



16 Q. With your answers to the last three questions in mind, if the Whistling Ridge Energy Project
 17 were constructed and operated as approved in the SCA (*i.e.*, without any changes to the
 18 Project), would you anticipate that this would result in any significant detrimental effects
 upon the environment?

19 A. Yes. There would be substantial habitat loss and excessive collision mortality of birds and
 20 bats (see my predictions above).

22 Q. In this matter, the State of Washington is required to exercise its police powers to protect the
 23 public health, safety, and welfare. In terms of impacts to wildlife resources, if this Project
 24 were constructed and operated as approved in 2012, how might that affect the public
 welfare?

25 A. In his book chapter entitled “Man’s efficient rush towards deadly dullness,” K. E. F. Watt
 26 (1973) warned that people need to encounter a certain level of biodiversity to maintain their
 27 psychological well-being. Evidence in support of his argument was relatively weak at the
 28 time, and perhaps it remains relatively weak today, but if one travels to those parts of the
 29 world where biodiversity has been scrubbed for immediate economic gain, as I have, then
 one can readily see the evidence of Watt’s thesis. People tend not to be happy in bleak

1 environments.

2
3
4 Q. Applicable law requires WRE to disclose the nature and degree of any changes since March
5 5, 2012 to project-related environmental conditions. In your professional opinion, what sort
6 of information from WRE is necessary to comply with this requirement?

7 A. The project description is fundamental to environmental review. WRE needs to disclose the
8 number of turbines, as well as their sizes in terms of MW of rated capacity, tower height and
9 rotor diameter. Also needed is the cut-in and cut-out speeds of the desired turbine model.

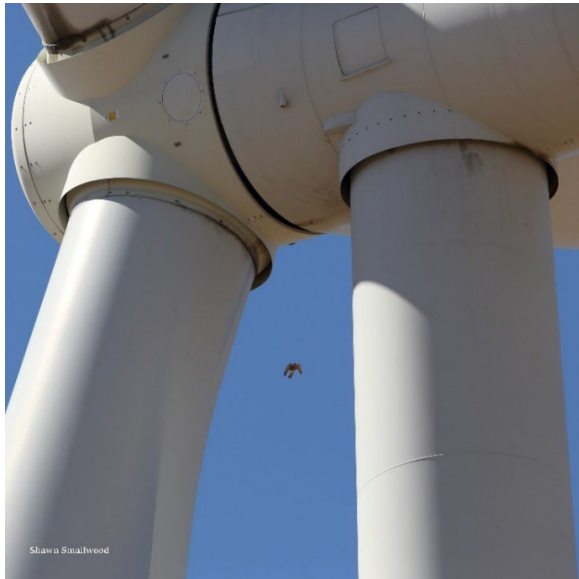
10 An adequate baseline ecological study is needed for the purpose of characterizing the
11 wildlife community as part of the existing environmental setting, and for the purpose of
12 accurately predicting potential project impacts. The wildlife community needs to be
13 measured using repeatable methods so that the same metrics can be measured post-
14 construction during the operational phase of the project.

15 The methodology for measuring project impacts needs to be fully described, which means
16 that a committee of qualified biologists should be seated to decide these methods before a
17 revised or supplemental EIS is circulated for public review.

18 Q. Applicable law requires WRE to disclose the nature and degree of any changes since March
19 5, 2012 to statements and information in project-related environmental documents. In your
20 professional opinion, what sort of information from WRE is necessary to comply with this
21 requirement?

22 A. The turbine layout and the turbine sizes need to be disclosed. In its request to extend the
23 term of its site certification agreement pursuant to WAC 463-68-080, WRE says it desires to
24 review the feasibility of installing fewer but taller wind turbines. It is essential for the
25 purpose of predicting impacts to wildlife to know the number, layout, and heights of the
26 wind turbines. It is also important to disclose changes to wind turbine technology that might
27 increase wildlife collision risk, such as lower cut-in and higher cut-out speeds. It is
28 important to disclose the turbine model, so that experts such as myself can ascertain whether
29 the model poses excessive collision risk. For example, some wind turbine models present
cavity-roosting and cavity-nesting wildlife with entryways into the turbine (Photos 5 and 6).

Another need for disclosure of updated project information is whether there has been any
change to the proposed methods for measuring and responding to collision mortality. Since
2012, there have been significant scientific and technological advances in measuring and
responding to collision mortality. Will WRE commit as part of its present extension request
to implement these advances?



Photos 5 and 6. One of a pair of American kestrels repeatedly attempts to enter the blade sleeve of an operative turbine in the APWRA in September 2015.

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15 Q. On March 23, 2012, only eighteen days after the effective date of the WREP SCA, the U.S.
16 Fish and Wildlife Service adopted its Land-Based Wind Energy Guidelines. Now that WRE
17 seeks to amend the SCA and to extend its term, is it important to apply these Guidelines to
18 the Project?

19 A. To a substantial degree, yes, but the U.S. Fish and Wildlife Service's Land-Based Wind
20 Energy Guidelines are outdated, and some portions of them were inadequate to begin with.
21 The Guidelines should be implemented where they are consistent with and supported by the
22 advances that have been made in the science directed to wind and wildlife.

23 Q. In your professional opinion, do you have any concerns with the fact that none of the plans,
24 specifications, surveys, studies, reports, disclosures, analyses, and proposed mitigation
25 measures for the Project and its impacts have been updated in at least 12 years (and for some
26 of these materials much longer than that)?

27 A. Yes. The surveys and reports in support of the FEIS were deeply flawed at the time, but
28 today they should be seen as anachronistic even by their authors. Some of the approaches
29 that appeared in Johnson et al. (2009) have been thoroughly discredited (see Smallwood and
Neher 2017). Some no longer appear in modern WEST reports, probably because – in my
opinion – they came to be widely viewed as ineffective or misleading. And I will point out
that some of my own approaches, at least one of which was also used by WEST through at

1 least 2009, proved ineffective. All of us involved with wind and wildlife issues have needed
2 to modify our methods per the scientific process. A lot of scientific progress has been
3 accomplished over the past 12 years.

4
5 Q. In your professional opinion, before the State of Washington decides whether to extend the
6 term (duration) of the 2012 WREP SCA, should EFSEC first require from WRE updated
7 plans, specifications, surveys, studies, reports, disclosures, analyses, and proposed
8 mitigation measures for the Project and its impacts?

9
10 A. Yes.

11 Q. At page 4 of the Extension Request, WRE pledges that “[i]n seeking this request, the
12 Applicant will utilize this time to . . . update environmental information and engage with
13 stakeholders.” In your professional opinion, should WRE follow through on these pledges
14 before the record is closed to public comments on the Extension Request?

15 A. I understand that the record will close to public comments within days, so I do not see how
16 WRE could follow through with its pledge. The environmental information that needs to be
17 updated would require at least one year, but ideally several years.

18 Q. Applicable law authorizes the Council to “retain an independent consultant, at the certificate
19 holder’s expense, to evaluate and make recommendations about whether changes to the site
20 certification agreement, regulatory permits, or project-related environmental documents are
21 necessary or appropriate. This work may include, but is not limited to, verification of
22 project-related environmental conditions, regulatory requirements, or appropriate
23 technology.” In your professional opinion, should the Council do so?

24 A. Yes, but it is essential that the consultant(s) is truly independent and qualified. Ideal would
25 be to adopt the Alameda County SRC’s approach as a model of how to engage one or more
26 consultants. The SRC members were nominated by various stakeholder groups, and then
27 managed and paid by the permitting agency. On each issue addressed, consensus among
28 SRC members was the goal, but otherwise majority votes were used to decide the issue.

29 Q. Applicable law requires WRE to disclose the nature and degree of any changes since March
30 5, 2012 to project design for this Project. In your professional opinion, what sort of
31 information from WRE is necessary to comply with this requirement?

1 A. WRE should disclose the number, layout, and heights of the proposed wind turbines, as well
2 as the turbine model and its attributes such as cut-in and cut-out speeds. Also, any changes
3 to post-construction fatality monitoring need to be disclosed.
4

5 Q. The 2012 SCA allows up to 35 wind turbines, each at up to 430 feet tall. At page 5 of the
6 Extension Request, WRE discloses that a major purpose of the Extension Request is to
7 allow WRE “to review and if feasible to propose the installation of fewer but taller wind
8 turbine generators and associated facilities within the designated and approved micrositing
9 corridors.” Does this disclosure provide enough information for you to evaluate and provide
10 meaningful comments on what types of changes to the Project are being contemplated by
11 WRE and the potential impacts of those changes?
12

13 A. No, I need to know the number, layout, and height of the turbines, along with the turbine
14 model and its operative attributes. For each repowering job that I have assisted with micro-
15 siting recommendations, all of this information was provided to me, and it was needed.
16

17 Q. Applicable law requires the State of Washington to consider “[w]hether any new
18 information or changed conditions indicate the existence of probable significant adverse
19 environmental impacts that were not covered in any project-related environmental
20 documents.” Does WRE’s disclosure in its Extension Request that it is contemplating
21 “fewer but taller wind turbine generators” constitute new information or changed conditions
22 that may indicate the existence of probable significant adverse environmental impacts of the
23 Project that were not covered in any project-related environmental documents?
24

25 A. Yes, outside the context of micro-siting to minimize impacts to particular species, taller
26 turbine towers are thought to be generally more dangerous to nocturnally migratory
27 songbirds, and especially to bats.
28

29 Q. In order to fully evaluate the impacts of using “fewer but taller wind turbine generators,”
would you need more information about what types of changes to the Project are being
contemplated by WRE, such as the potential numbers, heights, and models of turbines that
WRE might wish to pursue?

A. Yes. The details are very important to predicting impacts and for designing ecological
baseline studies and studies to measure impacts to wildlife. In my studies to help wind
companies micro-site their wind turbines for the purpose of minimizing impacts to target
species such as golden eagle, I establish a ceiling of inclusion of bird flight data I use to
develop collision hazard models. If I do not know the height of the turbine rotors with their
blade tips at the 12:00 position, then I cannot establish a flight observation ceiling. It is

1 mandatory for me to know the heights of the turbines if I am to prepare collision hazard
2 models from observational data. Also, species of bats vary in the height domains at which
3 they forage. As turbines extend into higher airspaces, different species of bat become more
4 vulnerable to wind turbine collision.

5 It is also essential to know the height above ground of the low reach of the turbine blades.
6 The lower the reach, the more bird and bat species are vulnerable to collision.

7 Q. If WRE is unwilling and is not required to disclose any information about what types of
8 changes to the Project it is contemplating, can you tell us (and the Council) some of the
9 typical turbine heights that applicants and developers are now proposing for other wind
10 energy projects?

11 A. More than a decade ago, new projects were being built with 2.3-MW wind turbines on 80-m
12 towers. These days, the land-based projects I am working on, or for which I am providing
13 testimony, consist of 3.5-MW, 5-MW, and even 7-MW wind turbines, each of which
14 requires successively higher towers, the tallest being 116 m at the hub with blades extending
15 as high as 197.5 m.

16 Q. How might the use of “fewer but taller wind turbine generators and associated facilities
17 within the designated and approved micrositing corridors” change the Project’s impacts to
18 wildlife resources?

19 A. Larger but fewer wind turbines composing a project of fixed total rated capacity should
20 provide for more opportunities to site the turbines in less hazardous terrain/vegetation
21 settings. On the other hand, the evidence is increasing that collision mortality of both bats
22 and nocturnally migratory songbirds increases with wind turbine size (Barclay et al. 2007,
23 Miao et al. 2019).

24 Q. If the Whistling Ridge Energy Project were constructed and operated with taller wind
25 turbines than were approved in 2012, would you anticipate that this would result in any
26 significant detrimental effect upon the environment?

27 A. Yes. See my last answer. Increased collision mortality associated with larger wind turbine
28 size could prove significant.

29 Q. Other than the potential use of “fewer but taller wind turbine generators,” are you aware of

1 any other new information or changed conditions that may indicate the existence of probable
2 significant adverse environmental impacts of the Project that were not covered in any
3 project-related environmental documents?

4 A. More species of wildlife have been assigned special-status, which is indicative of an
5 increasing decline of wildlife diversity and abundance in the face of anthropogenic
6 activities. Consistent with this trend, Rosenberg et al. (2019) found a 29% decline in overall
7 bird abundance across North America over the past 50 years. In my own work, I have found
8 declines of various species of wildlife, including of yellow-billed magpie (Smallwood and
9 Nakamoto 2009) and multiple species in and around areas of urban, commercial and
10 industrial development (Smallwood and Smallwood 2023). Over my last decade of research
11 within the APWRA, I documented 45% declines in abundance of both burrowing owl and
12 golden eagle (Smallwood, unpublished data). Human activities, including the development
13 of many wind energy projects, have cumulatively reduced many wildlife populations to
14 precarious levels. The wind and wildlife literature increasingly includes papers on
15 significant wind energy impacts to particular species. The project-related environmental
16 documents for the Whistling Ridge Energy Project lack consideration of these trends, but
17 they need to honestly address them.

18 Q. As a reminder (from a previous question), the State of Washington in this matter is required
19 to consider “the short-term and long-term environmental impacts of the proposal.” What
20 might be the short-term and long-term impacts to wildlife resources of constructing and
21 operating the Project with taller wind turbines than were approved in 2012?

22 A. As I testified earlier in this Declaration, larger turbines would require wider roads and larger
23 laydown areas, and a lot more construction grading resulting in wildlife habitat loss and
24 degradation. Larger turbines would also be expected to kill more bats and nocturnally
25 migratory songbirds per turbine. I will also add that in my experience, the larger the wind
26 turbine, the less likely the wind company will be willing or able to modify the turbine’s
27 appearance (such as through blade painting or tower lighting) or operations (such as
28 curtailment).

29 Q. As a reminder (from a previous question), the State of Washington is required in this matter
to exercise its police powers to protect the public health, safety, and welfare. In terms of
impacts to wildlife resources, if the Project were constructed and operated with taller wind
turbines than were approved in 2012, how might that affect the public welfare?

A. In addition to possible adverse psychological effects caused by reduced biodiversity, larger
wind turbines cast larger shadows and hence more substantial shadow flicker (Photos 7 and
8). In my experience with repowering of the APWRA, some local residents were angered by
the larger presence of the new, larger turbines. One informed me that the new larger wind

1 turbines was the reason he decided to move away from his longtime home in the APWRA.

2 Another effect is the increased frequency of wildfire. Multiple conflagrations and forest fires
3 have occurred in both states within the Columbia River Gorge area since the Whistling
4 Ridge Energy Project was approved in 2012. These have included large fires in Skamania
5 County, where the Project is proposed, as well as Klickitat County, the county adjacent to
6 the Project site. The Tunnel Five Fire in Skamania County, less than a year ago (in July
7 2023), occurred less than two miles from the Whistling Ridge site. One can expect that the
8 frequency of fires in these areas will only increase over time. Siting industrial-scale wind
9 energy projects, including with larger turbines, in these heavily forested areas increases the
10 risk of such fires.

11 Wildfires caused by wind turbines and their infrastructure were so common in the APWRA
12 that ranchers sacrificed range to maintain firebreaks around the wind turbines (Photos 9 and
13 10). I witnessed numerous fires caused by wind turbines while I worked in the APWRA.
14 Once, an electrical collector unit blew up only 250 m from where I was standing. A fire
15 ensued.



23
24 **Photos 7 and 8.** *Shadows cast on the ground by 100-KW wind turbines (left) and in fog by*
25 *1.79-MW turbines (right). Shadows very effectively extend the visual reach of wind*
26 *turbines. Animals startle as moving shadows pass overhead or nearby. After years of*
27 *performing research in wind project sites and wind resource area, my own startle*
28 *reactions to shadow-flicker have never waned.*

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29



Photo 9. Visible portion of burned grassland as seen from the fire’s starting point, where a decommissioned turbine was being dismantled by use of a blowtorch.



Photo 10. Example of a disked firebreak in the APWRA. On it lies a golden eagle fatality. This disking results in loss of wildlife habitat.

1
2 Q. In this matter, the State of Washington is required to consider “[r]easonable alternative
3 means by which the purpose of the proposal might be achieved.” Would you recommend
4 any reasonable alternatives (either to the design of the Project or to the Project itself) that
5 should be considered?

6 A. I suggest that it is not reasonable to develop a wind project in a forested environment. I
7 suggest that reasonable alternatives to this project would be to develop distributed
8 generation such as rooftop or blacktop solar, and to promote energy conservation. If the
9 project should go forward, then I suggest it should be reduced in rated capacity, it should be
10 carefully micro-sited to minimize impacts, and it should include an adaptive management
11 plan that is prepared in advance and well-informed by environmental data, managed by a
12 committee of qualified scientists, and responsive to surprises and to exceedances of
13 predefined impact thresholds.

14 Q. Given that no plans, specifications, surveys, studies, reports, disclosures, analyses, and
15 proposed mitigation measures for the Project and its impacts have been submitted or
16 updated in more than twelve years, the pending Extension Request would extend the term of
17 the SCA for several more years beyond the original expiration date, and the Extension
18 Request discloses that WRE intends to seek yet another extension even if the pending
19 Extension Request is approved, would you consider it a reasonable alternative to these
20 extension requests for WRE to instead file a new application for a new site certification
21 agreement?

22 A. Yes.

23 Q. Are your foregoing answers true and correct to the best of your knowledge and based on
24 your professional opinion?

25 A. Yes.

26 Q. If called as a witness for oral testimony in this matter, would you attest to the same answers
27 as given above?

28 A. Yes.

1 I declare under penalty of perjury that the foregoing is true and correct to the best of my
2 personal knowledge, information and belief.

3
4 Executed in Davis, California this 13th day of May, 2024.

5
6 

7 K. Shawn Smallwood

8 Barclay, R. M. R., E. F. Baerwald, and J. C. Gruver. 2007. Variation in bat and bird fatalities at
9 wind energy facilities: assessing the effects of rotor size and tower height. *Canadian Journal
of Zoology* 85:381–387.

10 Bay, K., K. Nasman, W. Erickson, K. Taylor, and K. Kosciuch. 2016. Predicting eagle fatalities at
11 wind facilities. *Journal of Wildlife Management* 80:1000–1010. DOI: 10.1002/jwmg.21086

12 Boyles, J. G., P. M. Cryan, G. F. McCracken, and T. H. Kunz. 2011. Economic importance of bats
13 in agriculture. *Science* 332:41–42.

14 Johnson, G., T. Enz, and K. Bay. 2009. Wildlife baseline studies for the Whistling Ridge Wind
15 Resource Area, Skamania County, Washington, Final Report September 11 – November 4,
16 2004, May 21 – July 14, 2006, and December 4, 2008 – May 29, 2009. Report to SDS
Lumber, Bingen, WA.

17 Miao, R., P. N. Ghosha, M. Khannab, W. Wangc, J. Rong. 2019. Effect of wind turbines on bird
18 abundance: A national scale analysis based on fixed effects models. *Energy Policy* 132:357–
366. <https://doi.org/10.1016/j.enpol.2019.04.040>

19 Rosenberg, K. V., A. M. Dokter, P. J. Blancher, J. R. Sauer, A. C. Smith, P. A. Smith, J. C.
20 Stanton, A. Panjabi, L. Helft, M. Parr, and P. P. Marra. 2019. Decline of the North American
21 avifauna. *Science* 10.1126/science.aaw1313 (2019).

22 Smallwood, K. S. 1994. Site invasibility by exotic birds and mammals. *Biological Conservation*
23 69:251–259.

24 Smallwood, K. S. 2008. Wind power company compliance with mitigation plans in the Altamont
25 Pass Wind Resource Area. *Environmental & Energy Law Policy Journal* 2(2):229–285.

26 Smallwood, K. S. 2017. Long search intervals under-estimate bird and bat fatalities caused by
27 wind turbines. *Wildlife Society Bulletin* 41:224–230.

28 Smallwood, K. S., and D. A. Bell. 2020a. Effects of wind turbine curtailment on bird and bat
29 fatalities. *Journal of Wildlife Management* 84:684–696. DOI: 10.1002/jwmg.21844

- 1
2 Smallwood, K. S., and D. A. Bell. 2020b. Relating bat passage rates to wind turbine fatalities. *Diversity* 12(84); doi:10.3390/d12020084.
- 3
4 Smallwood, K. S. and B. Nakamoto. 2009. Impacts of West Nile Virus epizootic on yellow-billed
5 magpie, american crow, and other birds in the Sacramento Valley, California. *The Condor*
6 111:247–254.
- 7
8 Smallwood, K. S., and L. Neher. 2017. Comparing bird and bat use data for siting new wind
9 power generation. Report CEC-500-2017-019, California Energy Commission Public Interest
10 Energy Research program, Sacramento, California. [https://tethys.pnnl.gov/sites/default/files/
11 publications/Smallwood-Neher-2017.pdf](https://tethys.pnnl.gov/sites/default/files/publications/Smallwood-Neher-2017.pdf)
- 12
13 Smallwood, K. S., and N. L. Smallwood. 2021. Breeding density and collision mortality of
14 loggerhead shrike (*Lanius ludovicianus*) in the Altamont Pass Wind Resource Area. *Diversity*
15 13, 540. <https://doi.org/10.3390/d13110540>.
- 16
17 Smallwood, K. S., and N. L. Smallwood. 2023. Measured effects of anthropogenic development
18 on vertebrate wildlife diversity. *Diversity* 15, 1037. <https://doi.org/10.3390/d15101037>.
- 19
20 Smallwood, K. S., D. A. Bell, and S. Standish. 2020. Dogs detect larger wind energy impacts on
21 bats and birds. *Journal of Wildlife Management* 84:852–864. DOI: 10.1002/jwmg.21863.
- 22
23 Smallwood, K. S., L. Neher, and D. A. Bell. 2017. Siting to Minimize Raptor Collisions: an
24 example from the Repowering Altamont Pass Wind Resource Area. M. Perrow, Ed., *Wildlife
25 and Wind Farms - Conflicts and Solutions*, Volume 2. Pelagic Publishing, Exeter, United
26 Kingdom. www.bit.ly/2v3cR9Q
- 27
28 Smallwood, K. S., D. A. Bell, E. L. Walther, E. Leyvas, S. Standish, J. Mount, B. Karas. 2018.
29 Estimating wind turbine fatalities using integrated detection trials. *Journal of Wildlife
Management* 82:1169–1184.
- 30
31 Watt, K.E.F. 1973. Man's Efficient Rush Towards Deadly Dullness. Pages 358–366 in A. Ternes,
32 Editor. *Ants, Indians, and Little Dinosaurs*. Charles Scribner's Sons, New York.
- 33
34 Wiens, J.D., and Kolar, P.S. 2021. Golden eagle population surveys in the vicinity of the Altamont
35 Pass Wind Resource Area, California, 2014–21: U.S. Geological Survey Open-File Report
36 2021–1107. 18 p. [https://doi.org/10.3133/
37 ofr20211107](https://doi.org/10.3133/ofr20211107).

Appendix 1

Kenneth Shawn Smallwood

Curriculum Vitae

3108 Finch Street
Davis, CA 95616
Phone (530) 756-4598
Cell (530) 601-6857
puma@dcn.org

Born May 3, 1963 in
Sacramento, California.
Married, father of two.

Ecologist

Expertise

- Finding solutions to controversial problems related to wildlife interactions with human industry, infrastructure, and activities;
- Wildlife monitoring and field study using GPS, thermal imaging, behavior surveys;
- Using systems analysis and experimental design principles to identify meaningful ecological patterns that inform management decisions.

Education

Ph.D. Ecology, University of California, Davis. September 1990.
M.S. Ecology, University of California, Davis. June 1987.
B.S. Anthropology, University of California, Davis. June 1985.
Corcoran High School, Corcoran, California. June 1981.

Experience

- 882 professional reports, including:
 - 93 peer reviewed publications
 - 24 in non-reviewed proceedings
- 763 reports, declarations, posters and book reviews
- 8 in mass media outlets
- 95 public presentations of research results

Editing for scientific journals: Guest Editor, *Wildlife Society Bulletin*, 2012-2013, of invited papers representing international views on the impacts of wind energy on wildlife and how to mitigate the impacts. Associate Editor, *Journal of Wildlife Management*, March 2004 to 30 June 2007. Editorial Board Member, *Environmental Management*, 10/1999 to 8/2004. Associate Editor, *Biological Conservation*, 9/1994 to 9/1995.

Member, Alameda County Scientific Review Committee (SRC), August 2006 to April 2011. The five-member committee investigated causes of bird and bat collisions in the Altamont Pass Wind Resource Area, and recommended mitigation and monitoring measures. The SRC reviewed the science underlying the Alameda County Avian Protection Program, and advised

the County on how to reduce wildlife fatalities.

Consulting Ecologist, 2004-2007, California Energy Commission (CEC). Provided consulting services as needed to the CEC on renewable energy impacts, monitoring and research, and produced several reports. Also collaborated with Lawrence-Livermore National Lab on research to understand and reduce wind turbine impacts on wildlife.

Consulting Ecologist, 1999-2013, U.S. Navy. Performed endangered species surveys, hazardous waste site monitoring, and habitat restoration for the endangered San Joaquin kangaroo rat, California tiger salamander, California red-legged frog, California clapper rail, western burrowing owl, salt marsh harvest mouse, and other species at Naval Air Station Lemoore; Naval Weapons Station, Seal Beach, Detachment Concord; Naval Security Group Activity, Skaggs Island; National Radio Transmitter Facility, Dixon; and, Naval Outlying Landing Field Imperial Beach.

Part-time Lecturer, 1998-2005, California State University, Sacramento. Instructed Mammalogy, Behavioral Ecology, and Ornithology Lab, Contemporary Environmental Issues, Natural Resources Conservation.

Senior Ecologist, 1999-2005, BioResource Consultants. Designed and implemented research and monitoring studies related to avian fatalities at wind turbines, avian electrocutions on electric distribution poles across California, and avian fatalities at transmission lines.

Chairman, Conservation Affairs Committee, The Wildlife Society--Western Section, 1999-2001. Prepared position statements and led efforts directed toward conservation issues, including travel to Washington, D.C. to lobby Congress for more wildlife conservation funding.

Systems Ecologist, 1995-2000, Institute for Sustainable Development. Headed ISD's program on integrated resources management. Developed indicators of ecological integrity for large areas, using remotely sensed data, local community involvement and GIS.

Associate, 1997-1998, Department of Agronomy and Range Science, University of California, Davis. Worked with Shu Geng and Mingua Zhang on several studies related to wildlife interactions with agriculture and patterns of fertilizer and pesticide residues in groundwater across a large landscape.

Lead Scientist, 1996-1999, National Endangered Species Network. Informed academic scientists and environmental activists about emerging issues regarding the Endangered Species Act and other environmental laws. Testified at public hearings on endangered species issues.

Ecologist, 1997-1998, Western Foundation of Vertebrate Zoology. Conducted field research to determine the impact of past mercury mining on the status of California red-legged frogs in Santa Clara County, California.

Senior Systems Ecologist, 1994-1995, EIP Associates, Sacramento, California. Provided consulting services in environmental planning, and quantitative assessment of land units for their conservation and restoration opportunities based on ecological resource requirements of 29 special-status species. Developed ecological indicators for prioritizing areas within Yolo County

to receive mitigation funds for habitat easements and restoration.

Post-Graduate Researcher, 1990-1994, Department of Agronomy and Range Science, *U.C. Davis*. Under Dr. Shu Geng's mentorship, studied landscape and management effects on temporal and spatial patterns of abundance among pocket gophers and species of Falconiformes and Carnivora in the Sacramento Valley. Managed and analyzed a data base of energy use in California agriculture. Assisted with landscape (GIS) study of groundwater contamination across Tulare County, California.

Work experience in graduate school: Co-taught Conservation Biology with Dr. Christine Schonewald, 1991 & 1993, UC Davis Graduate Group in Ecology; Reader for Dr. Richard Coss's course on Psychobiology in 1990, UC Davis Department of Psychology; Research Assistant to Dr. Walter E. Howard, 1988-1990, UC Davis Department of Wildlife and Fisheries Biology, testing durable baits for pocket gopher management in forest clearcuts; Research Assistant to Dr. Terrell P. Salmon, 1987-1988, UC Wildlife Extension, Department of Wildlife and Fisheries Biology, developing empirical models of mammal and bird invasions in North America, and a rating system for priority research and control of exotic species based on economic, environmental and human health hazards in California. Student Assistant to Dr. E. Lee Fitzhugh, 1985-1987, UC Cooperative Extension, Department of Wildlife and Fisheries Biology, developing and implementing statewide mountain lion track count for long-term monitoring.

Fulbright Research Fellow, Indonesia, 1988. Tested use of new sampling methods for numerical monitoring of Sumatran tiger and six other species of endemic felids, and evaluated methods used by other researchers.

Projects

Repowering wind energy projects through careful siting of new wind turbines using map-based collision hazard models to minimize impacts to volant wildlife. Funded by wind companies (principally NextEra Renewable Energy, Inc.), California Energy Commission and East Bay Regional Park District, I have collaborated with a GIS analyst and managed a crew of five field biologists performing golden eagle behavior surveys and nocturnal surveys on bats and owls. The goal is to quantify flight patterns for development of predictive models to more carefully site new wind turbines in repowering projects. Focused behavior surveys began May 2012 and continue. Collision hazard models have been prepared for seven wind projects, three of which were built. Planning for additional repowering projects is underway.

Test avian safety of new mixer-ejector wind turbine (MEWT). Designed and implemented a before-after, control-impact experimental design to test the avian safety of a new, shrouded wind turbine developed by Ogin Inc. (formerly known as FloDesign Wind Turbine Corporation). Supported by a \$718,000 grant from the California Energy Commission's Public Interest Energy Research program and a 20% match share contribution from Ogin, I managed a crew of seven field biologists who performed periodic fatality searches and behavior surveys, carcass detection trials, nocturnal behavior surveys using a thermal camera, and spatial analyses with the collaboration of a GIS analyst. Field work began 1 April 2012 and ended 30 March 2015 without Ogin installing its MEWTs, but we still achieved multiple important scientific advances.

Reduce avian mortality due to wind turbines at Altamont Pass. Studied wildlife impacts caused by 5,400 wind turbines at the world's most notorious wind resource area. Studied how impacts are perceived by monitoring and how they are affected by terrain, wind patterns, food resources, range management practices, wind turbine operations, seasonal patterns, population cycles, infrastructure management such as electric distribution, animal behavior and social interactions.

Reduce avian mortality on electric distribution poles. Directed research toward reducing bird electrocutions on electric distribution poles, 2000-2007. Oversaw 5 foudns of fatality searches at 10,000 poles from Orange County to Glenn County, California, and produced two large reports.

Cook *et al.* v. Rockwell International *et al.*, No. 90-K-181 (D. Colorado). Provided expert testimony on the role of burrowing animals in affecting the fate of buried and surface-deposited radioactive and hazardous chemical wastes at the Rocky Flats Plant, Colorado. Provided expert reports based on four site visits and an extensive document review of burrowing animals. Conducted transect surveys for evidence of burrowing animals and other wildlife on and around waste facilities. Discovered substantial intrusion of waste structures by burrowing animals. I testified in federal court in November 2005, and my clients were subsequently awarded a \$553,000,000 judgment by a jury. After appeals the award was increased to two billion dollars.

Hanford Nuclear Reservation Litigation. Provided expert testimony on the role of burrowing animals in affecting the fate of buried radioactive wastes at the Hanford Nuclear Reservation, Washington. Provided three expert reports based on three site visits and extensive document review. Predicted and verified a certain population density of pocket gophers on buried waste structures, as well as incidence of radionuclide contamination in body tissue. Conducted transect surveys for evidence of burrowing animals and other wildlife on and around waste facilities. Discovered substantial intrusion of waste structures by burrowing animals.

Expert testimony and declarations on proposed residential and commercial developments, gas-fired power plants, wind, solar and geothermal projects, water transfers and water transfer delivery systems, endangered species recovery plans, Habitat Conservation Plans and Natural Communities Conservation Programs. Testified before multiple government agencies, Tribunals, Boards of Supervisors and City Councils, and participated with press conferences and depositions. Prepared expert witness reports and court declarations, which are summarized under Reports (below).

Protocol-level surveys for special-status species. Used California Department of Fish and Wildlife and US Fish and Wildlife Service protocols to search for California red-legged frog, California tiger salamander, arroyo southwestern toad, blunt-nosed leopard lizard, western pond turtle, giant kangaroo rat, San Joaquin kangaroo rat, San Joaquin kit fox, western burrowing owl, Swainson's hawk, Valley elderberry longhorn beetle and other special-status species.

Conservation of San Joaquin kangaroo rat. Performed research to identify factors responsible for the decline of this endangered species at Lemoore Naval Air Station, 2000-2013, and implemented habitat enhancements designed to reverse the trend and expand the population.

Impact of West Nile Virus on yellow-billed magpies. Funded by Sacramento-Yolo Mosquito and Vector Control District, 2005-2008, compared survey results pre- and post-West Nile Virus epidemic for multiple bird species in the Sacramento Valley, particularly on yellow-billed magpie and American crow due to susceptibility to WNV.

Workshops on HCPs. Assisted Dr. Michael Morrison with organizing and conducting a 2-day workshop on Habitat Conservation Plans, sponsored by Southern California Edison, and another 1-day workshop sponsored by PG&E. These Workshops were attended by academics, attorneys, and consultants with HCP experience. We guest-edited a Proceedings published in Environmental Management.

Mapping of biological resources along Highways 101, 46 and 41. Used GPS and GIS to delineate vegetation complexes and locations of special-status species along 26 miles of highway in San Luis Obispo County, 14 miles of highway and roadway in Monterey County, and in a large area north of Fresno, including within reclaimed gravel mining pits.

GPS mapping and monitoring at restoration sites and at Caltrans mitigation sites. Monitored the success of elderberry shrubs at one location, the success of willows at another location, and the response of wildlife to the succession of vegetation at both sites. Also used GPS to monitor the response of fossorial animals to yellow star-thistle eradication and natural grassland restoration efforts at Bear Valley in Colusa County and at the decommissioned Mather Air Force Base in Sacramento County.

Mercury effects on Red-legged Frog. Assisted Dr. Michael Morrison and US Fish and Wildlife Service in assessing the possible impacts of historical mercury mining on the federally listed California red-legged frog in Santa Clara County. Also measured habitat variables in streams.

Opposition to proposed No Surprises rule. Wrote a white paper and summary letter explaining scientific grounds for opposing the incidental take permit (ITP) rules providing ITP applicants and holders with general assurances they will be free of compliance with the Endangered Species Act once they adhere to the terms of a “properly functioning HCP.” Submitted 188 signatures of scientists and environmental professionals concerned about No Surprises rule US Fish and Wildlife Service, National Marine Fisheries Service, all US Senators.

Natomas Basin Habitat Conservation Plan alternative. Designed narrow channel marsh to increase the likelihood of survival and recovery in the wild of giant garter snake, Swainson’s hawk and Valley Elderberry Longhorn Beetle. The design included replication and interspersed treatments for experimental testing of critical habitat elements. I provided a report to Northern Territories, Inc.

Assessments of agricultural production system and environmental technology transfer to China. Twice visited China and interviewed scientists, industrialists, agriculturalists, and the Directors of the Chinese Environmental Protection Agency and the Department of Agriculture to assess the need and possible pathways for environmental clean-up technologies and trade opportunities between the US and China.

Yolo County Habitat Conservation Plan. Conducted landscape ecology study of Yolo County to spatially prioritize allocation of mitigation efforts to improve ecosystem functionality within the County from the perspective of 29 special-status species of wildlife and plants. Used a hierarchically structured indicators approach to apply principles of landscape and ecosystem ecology, conservation biology, and local values in rating land units. Derived GIS maps to help guide the conservation area design, and then developed implementation strategies.

Mountain lion track count. Developed and conducted a carnivore monitoring program throughout California since 1985. Species counted include mountain lion, bobcat, black bear, coyote, red and gray fox, raccoon, striped skunk, badger, and black-tailed deer. Vegetation and land use are also monitored. Track survey transect was established on dusty, dirt roads within randomly selected quadrats.

Sumatran tiger and other felids. Upon award of Fulbright Research Fellowship, I designed and initiated track counts for seven species of wild cats in Sumatra, including Sumatran tiger, fishing cat, and golden cat. Spent four months on Sumatra and Java in 1988, and learned Bahasa Indonesia, the official Indonesian language.

Wildlife in agriculture. Beginning as post-graduate research, I studied pocket gophers and other wildlife in 40 alfalfa fields throughout the Sacramento Valley, and I surveyed for wildlife along a 200-mile road transect since 1989 with a hiatus of 1996-2004. The data are analyzed using GIS and methods from landscape ecology, and the results published and presented orally to farming groups in California and elsewhere. I also conducted the first study of wildlife in cover crops used on vineyards and orchards.

Agricultural energy use and Tulare County groundwater study. Developed and analyzed a data base of energy use in California agriculture, and collaborated on a landscape (GIS) study of groundwater contamination across Tulare County, California.

Pocket gopher damage in forest clear-cuts. Developed gopher sampling methods and tested various poison baits and baiting regimes in the largest-ever field study of pocket gopher management in forest plantations, involving 68 research plots in 55 clear-cuts among 6 National Forests in northern California.

Risk assessment of exotic species in North America. Developed empirical models of mammal and bird species invasions in North America, as well as a rating system for assigning priority research and control to exotic species in California, based on economic, environmental, and human health hazards.

Peer Reviewed Publications

Smallwood, K. S., and N. L. Smallwood. 2023. Measured effects of anthropogenic development on vertebrate wildlife diversity. *Diversity* 15, 1037. <https://doi.org/10.3390/d15101037>.

Bell, D. A., S. A. Snyder, J. E. DiDonato, and K. S. Smallwood. 2023. Conspecific carcass removal from a wind project study plot by a great horned owl (*Bubo Virginianus*). *Journal of Raptor Research* 57:489-492.

Kitano, M., K. S. Smallwood, and K. Fukaya. 2022. Bird carcass detection from integrated trials at multiple wind farms. *Journal of Wildlife Management*: In press.

Smallwood, K. S. 2022. Utility-scale solar impacts to volant wildlife. *Journal of Wildlife Management*: e22216. <https://doi.org/10.1002/jwmg.22216>

Smallwood, K. S., and N. L. Smallwood. 2021. Breeding density and collision mortality of

- loggerhead shrike (*Lanius ludovicianus*) in the Altamont Pass Wind Resource Area. *Diversity* 13, 540. <https://doi.org/10.3390/d13110540>.
- Smallwood, K. S. 2020. USA wind energy-caused bat fatalities increase with shorter fatality search intervals. *Diversity* 12(98); <https://doi.org/10.3390/d12030098>
- Smallwood, K. S., D. A. Bell, and S. Standish. 2020. Dogs detect larger wind energy impacts on bats and birds. *Journal of Wildlife Management* 84:852-864. DOI: 10.1002/jwmg.21863.
- Smallwood, K. S., and D. A. Bell. 2020. Relating bat passage rates to wind turbine fatalities. *Diversity* 12(84); doi:10.3390/d12020084.
- Smallwood, K. S., and D. A. Bell. 2020. Effects of wind turbine curtailment on bird and bat fatalities. *Journal of Wildlife Management* 84:684-696. DOI: 10.1002/jwmg.21844
- Kitano, M., M. Ino, K. S. Smallwood, and S. Shiraki. 2020. Seasonal difference in carcass persistence rates at wind farms with snow, Hokkaido, Japan. *Ornithological Science* 19: 63 – 71.
- Smallwood, K. S. and M. L. Morrison. 2018. Nest-site selection in a high-density colony of burrowing owls. *Journal of Raptor Research* 52:454-470.
- Smallwood, K. S., D. A. Bell, E. L. Walther, E. Leyvas, S. Standish, J. Mount, B. Karas. 2018. Estimating wind turbine fatalities using integrated detection trials. *Journal of Wildlife Management* 82:1169-1184.
- Smallwood, K. S. 2017. Long search intervals under-estimate bird and bat fatalities caused by wind turbines. *Wildlife Society Bulletin* 41:224-230.
- Smallwood, K. S. 2017. The challenges of addressing wildlife impacts when repowering wind energy projects. Pages 175-187 in Köppel, J., Editor, *Wind Energy and Wildlife Impacts: Proceedings from the CWW2015 Conference*. Springer. Cham, Switzerland.
- May, R., Gill, A. B., Köppel, J. Langston, R. H.W., Reichenbach, M., Scheidat, M., Smallwood, S., Voigt, C. C., Hüppop, O., and Portman, M. 2017. Future research directions to reconcile wind turbine–wildlife interactions. Pages 255-276 in Köppel, J., Editor, *Wind Energy and Wildlife Impacts: Proceedings from the CWW2015 Conference*. Springer. Cham, Switzerland.
- Smallwood, K. S. 2017. Monitoring birds. M. Perrow, Ed., *Wildlife and Wind Farms - Conflicts and Solutions*, Volume 2. Pelagic Publishing, Exeter, United Kingdom. www.bit.ly/2v3cR9Q
- Smallwood, K. S., L. Neher, and D. A. Bell. 2017. Turbine siting for raptors: an example from Repowering of the Altamont Pass Wind Resource Area. M. Perrow, Ed., *Wildlife and Wind Farms - Conflicts and Solutions*, Volume 2. Pelagic Publishing, Exeter, United Kingdom. www.bit.ly/2v3cR9Q
- Johnson, D. H., S. R. Loss, K. S. Smallwood, W. P. Erickson. 2016. Avian fatalities at wind energy facilities in North America: A comparison of recent approaches. *Human–Wildlife*

- Interactions 10(1):7-18.
- Sadar, M. J., D. S.-M. Guzman, A. Mete, J. Foley, N. Stephenson, K. H. Rogers, C. Grosset, K. S. Smallwood, J. Shipman, A. Wells, S. D. White, D. A. Bell, and M. G. Hawkins. 2015. Mange Caused by a novel *Micnemidocoptes* mite in a Golden Eagle (*Aquila chrysaetos*). *Journal of Avian Medicine and Surgery* 29(3):231-237.
- Smallwood, K. S. 2015. Habitat fragmentation and corridors. Pages 84-101 in M. L. Morrison and H. A. Mathewson, Eds., *Wildlife habitat conservation: concepts, challenges, and solutions*. John Hopkins University Press, Baltimore, Maryland, USA.
- Mete, A., N. Stephenson, K. Rogers, M. G. Hawkins, M. Sadar, D. Guzman, D. A. Bell, J. Shipman, A. Wells, K. S. Smallwood, and J. Foley. 2014. Emergence of *Knemidocoptic* mange in wild Golden Eagles (*Aquila chrysaetos*) in California. *Emerging Infectious Diseases* 20(10):1716-1718.
- Smallwood, K. S. 2013. Introduction: Wind-energy development and wildlife conservation. *Wildlife Society Bulletin* 37: 3-4.
- Smallwood, K. S. 2013. Comparing bird and bat fatality-rate estimates among North American wind-energy projects. *Wildlife Society Bulletin* 37:19-33. + Online Supplemental Material.
- Smallwood, K. S., L. Neher, J. Mount, and R. C. E. Culver. 2013. Nesting burrowing owl abundance in the Altamont Pass Wind Resource Area, California. *Wildlife Society Bulletin*: 37:787-795.
- Smallwood, K. S., D. A. Bell, B. Karas, and S. A. Snyder. 2013. Response to Huso and Erickson Comments on Novel Scavenger Removal Trials. *Journal of Wildlife Management* 77: 216-225.
- Bell, D. A., and K. S. Smallwood. 2010. Birds of prey remain at risk. *Science* 330:913.
- Smallwood, K. S., D. A. Bell, S. A. Snyder, and J. E. DiDonato. 2010. Novel scavenger removal trials increase estimates of wind turbine-caused avian fatality rates. *Journal of Wildlife Management* 74: 1089-1097 + Online Supplemental Material.
- Smallwood, K. S., L. Neher, and D. A. Bell. 2009. Map-based repowering and reorganization of a wind resource area to minimize burrowing owl and other bird fatalities. *Energies* 2009(2):915-943. <http://www.mdpi.com/1996-1073/2/4/915>
- Smallwood, K. S. and B. Nakamoto. 2009. Impacts of West Nile Virus epizootic on yellow-billed magpie, american crow, and other birds in the Sacramento Valley, California. *The Condor* 111:247-254.
- Smallwood, K. S., L. Ruge, and M. L. Morrison. 2009. Influence of behavior on bird mortality in wind energy developments: The Altamont Pass Wind Resource Area, California. *Journal of Wildlife Management* 73:1082-1098.
- Smallwood, K. S. and B. Karas. 2009. Avian and bat fatality rates at old-generation and repowered

- wind turbines in California. *Journal of Wildlife Management* 73:1062-1071.
- Smallwood, K. S. 2008. Wind power company compliance with mitigation plans in the Altamont Pass Wind Resource Area. *Environmental & Energy Law Policy Journal* 2(2):229-285.
- Smallwood, K. S., C. G. Thelander. 2008. Bird mortality in the Altamont Pass Wind Resource Area, California. *Journal of Wildlife Management* 72:215-223.
- Smallwood, K. S. 2007. Estimating wind turbine-caused bird mortality. *Journal of Wildlife Management* 71:2781-2791.
- Smallwood, K. S., C. G. Thelander, M. L. Morrison, and L. M. Ruggie. 2007. Burrowing owl mortality in the Altamont Pass Wind Resource Area. *Journal of Wildlife Management* 71:1513-1524.
- Cain, J. W. III, K. S. Smallwood, M. L. Morrison, and H. L. Loffland. 2005. Influence of mammal activity on nesting success of Passerines. *J. Wildlife Management* 70:522-531.
- Smallwood, K.S. 2002. Habitat models based on numerical comparisons. Pages 83-95 *in* Predicting species occurrences: Issues of scale and accuracy, J. M. Scott, P. J. Heglund, M. Morrison, M. Raphael, J. Haufler, and B. Wall, editors. Island Press, Covello, California.
- Morrison, M. L., K. S. Smallwood, and L. S. Hall. 2002. Creating habitat through plant relocation: Lessons from Valley elderberry longhorn beetle mitigation. *Ecological Restoration* 21: 95-100.
- Zhang, M., K. S. Smallwood, and E. Anderson. 2002. Relating indicators of ecological health and integrity to assess risks to sustainable agriculture and native biota. Pages 757-768 *in* D.J. Rapport, W.L. Lasley, D.E. Rolston, N.O. Nielsen, C.O. Qualset, and A.B. Damania (eds.), *Managing for Healthy Ecosystems*, Lewis Publishers, Boca Raton, Florida USA.
- Wilcox, B. A., K. S. Smallwood, and J. A. Kahn. 2002. Toward a forest Capital Index. Pages 285-298 *in* D.J. Rapport, W.L. Lasley, D.E. Rolston, N.O. Nielsen, C.O. Qualset, and A.B. Damania (eds.), *Managing for Healthy Ecosystems*, Lewis Publishers, Boca Raton, Florida USA.
- Smallwood, K.S. 2001. The allometry of density within the space used by populations of Mammalian Carnivores. *Canadian Journal of Zoology* 79:1634-1640.
- Smallwood, K.S., and T.R. Smith. 2001. Study design and interpretation of Sorex density estimates. *Annales Zoologici Fennici* 38:141-161.
- Geng, S., Yixing Zhou, Minghua Zhang, and K. Shawn Smallwood. 2001. A sustainable agro-ecological solution to water shortage in North China Plain (Huabei Plain). *Environmental Planning and Management* 44:345-355.
- Smallwood, K. Shawn, Lourdes Ruggie, Stacia Hoover, Michael L. Morrison, Carl Thelander. 2001. Intra- and inter-turbine string comparison of fatalities to animal burrow densities at Altamont Pass. Pages 23-37 in S. S. Schwartz, ed., *Proceedings of the National Avian-Wind Power Planning Meeting IV*. RESOLVE, Inc., Washington, D.C.

- Smallwood, K.S., S. Geng, and M. Zhang. 2001. Comparing pocket gopher (*Thomomys bottae*) density in alfalfa stands to assess management and conservation goals in northern California. *Agriculture, Ecosystems & Environment* 87: 93-109.
- Smallwood, K. S. 2001. Linking habitat restoration to meaningful units of animal demography. *Restoration Ecology* 9:253-261.
- Smallwood, K.S., A. Gonzales, T. Smith, E. West, C. Hawkins, E. Stitt, C. Keckler, C. Bailey, and K. Brown. 2000. Suggested standards for science applied to conservation issues. *Transactions of the Western Section of the Wildlife Society* 36:40-49.
- Smallwood, K. S. 2000. A crosswalk from the Endangered Species Act to the HCP Handbook and real HCPs. *Environmental Management* 26, Supplement 1:23-35.
- Smallwood, K. S., J. Beyea and M. Morrison. 1999. Using the best scientific data for endangered species conservation. *Environmental Management* 24:421-435.
- Smallwood, K. S. 1999. Scale domains of abundance among species of Mammalian Carnivora. *Environmental Conservation* 26:102-111.
- Smallwood, K.S. 1999. Suggested study attributes for making useful population density estimates. *Transactions of the Western Section of the Wildlife Society* 35: 76-82.
- Smallwood, K. S. and M. L. Morrison. 1999. Estimating burrow volume and excavation rate of pocket gophers (*Geomyidae*). *Southwestern Naturalist* 44:173-183.
- Smallwood, K. S. and M. L. Morrison. 1999. Spatial scaling of pocket gopher (*Geomyidae*) density. *Southwestern Naturalist* 44:73-82.
- Smallwood, K. S. 1999. Abating pocket gophers (*Thomomys* spp.) to regenerate forests in clearcuts. *Environmental Conservation* 26:59-65.
- Smallwood, K. S. 1998. Patterns of black bear abundance. *Transactions of the Western Section of the Wildlife Society* 34:32-38.
- Smallwood, K. S. 1998. On the evidence needed for listing northern goshawks (*Accipter gentilis*) under the Endangered Species Act: a reply to Kennedy. *J. Raptor Research* 32:323-329.
- Smallwood, K. S., B. Wilcox, R. Leidy, and K. Yarris. 1998. Indicators assessment for Habitat Conservation Plan of Yolo County, California, USA. *Environmental Management* 22: 947-958.
- Smallwood, K. S., M. L. Morrison, and J. Beyea. 1998. Animal burrowing attributes affecting hazardous waste management. *Environmental Management* 22: 831-847.
- Smallwood, K. S. and C. M. Schonewald. 1998. Study design and interpretation for mammalian carnivore density estimates. *Oecologia* 113:474-491.

- Zhang, M., S. Geng, and K. S. Smallwood. 1998. Nitrate contamination in groundwater of Tulare County, California. *Ambio* 27(3):170-174.
- Smallwood, K. S. and M. L. Morrison. 1997. Animal burrowing in the waste management zone of Hanford Nuclear Reservation. Proceedings of the Western Section of the Wildlife Society Meeting 33:88-97.
- Morrison, M. L., K. S. Smallwood, and J. Beyea. 1997. Monitoring the dispersal of contaminants by wildlife at nuclear weapons production and waste storage facilities. *The Environmentalist* 17:289-295.
- Smallwood, K. S. 1997. Interpreting puma (*Puma concolor*) density estimates for theory and management. *Environmental Conservation* 24(3):283-289.
- Smallwood, K. S. 1996. Managing vertebrates in cover crops: a first study. *American Journal of Alternative Agriculture* 11:155-160.
- Smallwood, K. S. and S. Geng. 1997. Multi-scale influences of gophers on alfalfa yield and quality. *Field Crops Research* 49:159-168.
- Smallwood, K. S. and C. Schonewald. 1996. Scaling population density and spatial pattern for terrestrial, mammalian carnivores. *Oecologia* 105:329-335.
- Smallwood, K. S., G. Jones, and C. Schonewald. 1996. Spatial scaling of allometry for terrestrial, mammalian carnivores. *Oecologia* 107:588-594.
- Van Vuren, D. and K. S. Smallwood. 1996. Ecological management of vertebrate pests in agricultural systems. *Biological Agriculture and Horticulture* 13:41-64.
- Smallwood, K. S., B. J. Nakamoto, and S. Geng. 1996. Association analysis of raptors on an agricultural landscape. Pages 177-190 in D.M. Bird, D.E. Varland, and J.J. Negro, eds., *Raptors in human landscapes*. Academic Press, London.
- Erichsen, A. L., K. S. Smallwood, A. M. Commandatore, D. M. Fry, and B. Wilson. 1996. White-tailed Kite movement and nesting patterns in an agricultural landscape. Pages 166-176 in D. M. Bird, D. E. Varland, and J. J. Negro, eds., *Raptors in human landscapes*. Academic Press, London.
- Smallwood, K. S. 1995. Scaling Swainson's hawk population density for assessing habitat-use across an agricultural landscape. *J. Raptor Research* 29:172-178.
- Smallwood, K. S. and W. A. Erickson. 1995. Estimating gopher populations and their abatement in forest plantations. *Forest Science* 41:284-296.
- Smallwood, K. S. and E. L. Fitzhugh. 1995. A track count for estimating mountain lion *Felis concolor californica* population trend. *Biological Conservation* 71:251-259
- Smallwood, K. S. 1994. Site invasibility by exotic birds and mammals. *Biological Conservation*

69:251-259.

Smallwood, K. S. 1994. Trends in California mountain lion populations. *Southwestern Naturalist* 39:67-72.

Smallwood, K. S. 1993. Understanding ecological pattern and process by association and order. *Acta Oecologica* 14(3):443-462.

Smallwood, K. S. and E. L. Fitzhugh. 1993. A rigorous technique for identifying individual mountain lions *Felis concolor* by their tracks. *Biological Conservation* 65:51-59.

Smallwood, K. S. 1993. Mountain lion vocalizations and hunting behavior. *The Southwestern Naturalist* 38:65-67.

Smallwood, K. S. and T. P. Salmon. 1992. A rating system for potential exotic vertebrate pests. *Biological Conservation* 62:149-159.

Smallwood, K. S. 1990. Turbulence and the ecology of invading species. Ph.D. Thesis, University of California, Davis.

Peer-reviewed Reports

Smallwood, K. S., and L. Neher. 2017. Comparing bird and bat use data for siting new wind power generation. Report CEC-500-2017-019, California Energy Commission Public Interest Energy Research program, Sacramento, California. <http://www.energy.ca.gov/2017publications/CEC-500-2017-019/CEC-500-2017-019.pdf> and <http://www.energy.ca.gov/2017publications/CEC-500-2017-019/CEC-500-2017-019-APA-F.pdf>

Smallwood, K. S. 2016. Bird and bat impacts and behaviors at old wind turbines at Forebay, Altamont Pass Wind Resource Area. Report CEC-500-2016-066, California Energy Commission Public Interest Energy Research program, Sacramento, California. <http://www.energy.ca.gov/publications/displayOneReport.php?pubNum=CEC-500-2016-066>

Sinclair, K. and E. DeGeorge. 2016. Framework for Testing the Effectiveness of Bat and Eagle Impact-Reduction Strategies at Wind Energy Projects. S. Smallwood, M. Schirmacher, and M. Morrison, eds., Technical Report NREL/TP-5000-65624, National Renewable Energy Laboratory, Golden, Colorado.

Brown, K., K. S. Smallwood, J. Szewczak, and B. Karas. 2016. Final 2012-2015 Report Avian and Bat Monitoring Project Vasco Winds, LLC. Prepared for NextEra Energy Resources, Livermore, California.

Brown, K., K. S. Smallwood, J. Szewczak, and B. Karas. 2014. Final 2013-2014 Annual Report Avian and Bat Monitoring Project Vasco Winds, LLC. Prepared for NextEra Energy Resources, Livermore, California.

Brown, K., K. S. Smallwood, and B. Karas. 2013. Final 2012-2013 Annual Report Avian and Bat

Monitoring Project Vasco Winds, LLC. Prepared for NextEra Energy Resources, Livermore, California. http://www.altamontsrc.org/alt_doc/p274_ventus_vasco_winds_2012_13_avian_bat_monitoring_report_year_1.pdf

Smallwood, K. S., L. Neher, D. Bell, J. DiDonato, B. Karas, S. Snyder, and S. Lopez. 2009. Range Management Practices to Reduce Wind Turbine Impacts on Burrowing Owls and Other Raptors in the Altamont Pass Wind Resource Area, California. Final Report to the California Energy Commission, Public Interest Energy Research – Environmental Area, Contract No. CEC-500-2008-080. Sacramento, California. 183 pp. <https://tethys.pnnl.gov/publications/range-management-practices-reduce-wind-turbine-impacts-burrowing-owls-other-raptors>

Smallwood, K. S., and L. Neher. 2009. Map-Based Repowering of the Altamont Pass Wind Resource Area Based on Burrowing Owl Burrows, Raptor Flights, and Collisions with Wind Turbines. Final Report to the California Energy Commission, Public Interest Energy Research – Environmental Area, Contract No. CEC-500-2009-065. Sacramento, California. <http://www.energy.ca.gov/publications/displayOneReport.php?pubNum=CEC-500-2009-065>

Smallwood, K. S., K. Hunting, L. Neher, L. Spiegel and M. Yee. 2007. Indicating Threats to Birds Posed by New Wind Power Projects in California. Final Report to the California Energy Commission, Public Interest Energy Research – Environmental Area, Contract No. Submitted but not published. Sacramento, California.

Smallwood, K. S. and C. Thelander. 2005. Bird mortality in the Altamont Pass Wind Resource Area, March 1998 – September 2001 Final Report. National Renewable Energy Laboratory, NREL/SR-500-36973. Golden, Colorado. <https://www.nrel.gov/docs/fy05osti/36973.pdf>

Smallwood, K. S. and C. Thelander. 2004. Developing methods to reduce bird mortality in the Altamont Pass Wind Resource Area. Final Report to the California Energy Commission, Public Interest Energy Research – Environmental Area, Contract No. 500-01-019. Sacramento, California. 531 pp. <https://tethys.pnnl.gov/publications/developing-methods-reduce-bird-mortality-altamont-pass-wind-resource-area>

Thelander, C.G. S. Smallwood, and L. Ruge. 2003. Bird risk behaviors and fatalities at the Altamont Pass Wind Resource Area. Period of Performance: March 1998—December 2000. National Renewable Energy Laboratory, NREL/SR-500-33829. U.S. Department of Commerce, National Technical Information Service, Springfield, Virginia. 86 pp.

Thelander, C.G., S. Smallwood, and L. Ruge. 2001. Bird risk behaviors and fatalities at the Altamont Wind Resource Area – a progress report. Proceedings of the American Wind Energy Association, Washington D.C. 16 pp.

Non-Peer Reviewed Publications

Smallwood, K. S., L. Neher, and D. A. Bell. 2023. Golden eagle roost sites based on telemetry data. Report to Salka Energy, San Diego, California. 29 pp.

Smallwood, K. S. 2009. Methods manual for assessing wind farm impacts to birds. Bird

- Conservation Series 26, Wild Bird Society of Japan, Tokyo. T. Ura, ed., in English with Japanese translation by T. Kurosawa. 90 pp.
- Smallwood, K. S. 2009. Mitigation in U.S. Wind Farms. Pages 68-76 in H. Hötter (Ed.), Birds of Prey and Wind Farms: Analysis of problems and possible solutions. Documentation of an International Workshop in Berlin, 21st and 22nd October 2008. Michael-Otto-Institut im NABU, Goosstroot 1, 24861 Bergenhusen, Germany. <http://bergenhusen.nabu.de/forschung/greifvoegel/>
- Smallwood, K. S. 2007. Notes and recommendations on wildlife impacts caused by Japan's wind power development. Pages 242-245 in Yukihiro Kominami, Tatsuya Ura, Koshitawa, and Tsuchiya, Editors, Wildlife and Wind Turbine Report 5. Wild Bird Society of Japan, Tokyo.
- Thelander, C.G. and S. Smallwood. 2007. The Altamont Pass Wind Resource Area's Effects on Birds: A Case History. Pages 25-46 in Manuela de Lucas, Guyonne F.E. Janss, Miguel Ferrer Editors, Birds and Wind Farms: risk assessment and mitigation. Madrid: Quercus.
- Smallwood, K. S. and C. Thelander. 2006. Response to third review of Smallwood and Thelander (2004). In Terry Surles and Edward Vine, Eds., Avian/Wind Statistical Peer Review Project. Report to California Energy Commission. Contract No. 500-02-004. <https://tethys.pnnl.gov/sites/default/files/publications/Surles-2006.pdf>
- Neher, L. and S. Smallwood. 2005. Forecasting and minimizing avian mortality in siting wind turbines. Energy Currents. Fall Issue. ESRI, Inc., Redlands, California.
- Jennifer Davidson and Shawn Smallwood. 2004. Laying plans for a hydrogen highway. Comstock's Business, August 2004:18-20, 22, 24-26.
- Jennifer Davidson and Shawn Smallwood. 2004. Refined conundrum: California consumers demand more oil while opposing refinery development. Comstock's Business, November 2004:26-27, 29-30.
- Smallwood, K.S. 2002. Review of "The Atlas of Endangered Species." By Richard Mackay. Environmental Conservation 30:210-211.
- Smallwood, K.S. 2002. Review of "The Endangered Species Act. History, Conservation, and Public Policy." By Brian Czech and Paul B. Krausman. Environmental Conservation 29: 269-270.
- Smallwood, K.S. 1997. Spatial scaling of pocket gopher (Geomyidae) burrow volume. Abstract in Proceedings of 44th Annual Meeting, Southwestern Association of Naturalists. Department of Biological Sciences, University of Arkansas, Fayetteville.
- Smallwood, K.S. 1997. Estimating prairie dog and pocket gopher burrow volume. Abstract in Proceedings of 44th Annual Meeting, Southwestern Association of Naturalists. Department of Biological Sciences, University of Arkansas, Fayetteville.
- Smallwood, K.S. 1997. Animal burrowing parameters influencing toxic waste management. Abstract in Proceedings of Meeting, Western Section of the Wildlife Society.

- Smallwood, K.S, and Bruce Wilcox. 1996. Study and interpretive design effects on mountain lion density estimates. Abstract, page 93 in D.W. Padley, ed., *Proceedings 5th Mountain Lion Workshop*, Southern California Chapter, The Wildlife Society. 135 pp.
- Smallwood, K.S, and Bruce Wilcox. 1996. Ten years of mountain lion track survey. Page 94 in D.W. Padley, ed. Abstract, page 94 in D.W. Padley, ed., *Proceedings 5th Mountain Lion Workshop*, Southern California Chapter, The Wildlife Society. 135 pp.
- Smallwood, K.S, and M. Grigione. 1997. Photographic recording of mountain lion tracks. Pages 75-75 in D.W. Padley, ed., *Proceedings 5th Mountain Lion Workshop*, Southern California Chapter, The Wildlife Society. 135 pp.
- Smallwood, K.S., B. Wilcox, and J. Karr. 1995. An approach to scaling fragmentation effects. Brief 8, Ecosystem Indicators Working Group, 17 March, 1995. Institute for Sustainable Development, Thoreau Center for Sustainability – The Presidio, PO Box 29075, San Francisco, CA 94129-0075.
- Wilcox, B., and K.S. Smallwood. 1995. Ecosystem indicators model overview. Brief 2, Ecosystem Indicators Working Group, 17 March, 1995. Institute for Sustainable Development, Thoreau Center for Sustainability – The Presidio, PO Box 29075, San Francisco, CA 94129-0075.
- EIP Associates. 1996. Yolo County Habitat Conservation Plan. Yolo County Planning and Development Department, Woodland, California.
- Geng, S., K.S. Smallwood, and M. Zhang. 1995. Sustainable agriculture and agricultural sustainability. Proc. 7th International Congress SABRAO, 2nd Industrial Symp. WSAA. Taipei, Taiwan.
- Smallwood, K.S. and S. Geng. 1994. Landscape strategies for biological control and IPM. Pages 454-464 in W. Dehai, ed., Proc. International Conference on Integrated Resource Management for Sustainable Agriculture. Beijing Agricultural University, Beijing, China.
- Smallwood, K.S. and S. Geng. 1993. Alfalfa as wildlife habitat. California Alfalfa Symposium 23:105-8.
- Smallwood, K.S. and S. Geng. 1993. Management of pocket gophers in Sacramento Valley alfalfa. California Alfalfa Symposium 23:86-89.
- Smallwood, K.S. and E.L. Fitzhugh. 1992. The use of track counts for mountain lion population census. Pages 59-67 in C. Braun, ed. Mountain lion-Human Interaction Symposium and Workshop. Colorado Division of Wildlife, Fort Collins.
- Smallwood, K.S. and E.L. Fitzhugh. 1989. Differentiating mountain lion and dog tracks. Pages 58-63 in Smith, R.H., ed. Proc. Third Mountain Lion Workshop. Arizona Game and Fish Department, Phoenix.

Fitzhugh, E.L. and K.S. Smallwood. 1989. Techniques for monitoring mountain lion population levels. Pages 69-71 in Smith, R.H., ed. Proc. Third Mountain Lion Workshop. Arizona Game and Fish Department, Phoenix.

Reports to or by Alameda County Scientific Review Committee (Note: all documents linked to SRC website have since been removed by Alameda County)

Smallwood, K. S. 2014. Data Needed in Support of Repowering in the Altamont Pass WRA. SRC document P284, County of Alameda, Hayward, California.

Smallwood, K. S. 2013. Long-Term Trends in Fatality Rates of Birds and Bats in the Altamont Pass Wind Resource Area, California. SRC document R68, County of Alameda, Hayward, California.

Smallwood, K. S. 2013. Inter-annual Fatality rates of Target Raptor Species from 1999 through 2012 in the Altamont Pass Wind Resources Area. SRC document P268, County of Alameda, Hayward, California.

Smallwood, K. S. 2012. General Protocol for Performing Detection Trials in the FloDesign Study of the Safety of a Closed-bladed Wind Turbine. SRC document P246, County of Alameda, Hayward, California.

Smallwood, K. S., I. Neher, and J. Mount. 2012. Burrowing owl distribution and abundance study through two breeding seasons and intervening non-breeding period in the Altamont Pass Wind Resource Area, California. SRC document P245, County of Alameda, Hayward, California.

Smallwood, K. S. 2012. Draft study design for testing collision risk of Flodesign wind turbine in former AES Seawest wind projects in the Altamont Pass Wind Resource Area (APWRA). SRC document P238, County of Alameda, Hayward, California.

Smallwood, L. Neher, and J. Mount. 2012. Winter 2012 update on burrowing owl distribution and abundance study in the Altamont Pass Wind Resource Area, California. SRC document P232, County of Alameda, Hayward, California.

Smallwood, S. 2012. Status of avian utilization data collected in the Altamont Pass Wind Resource Area, 2005-2011. SRC document P231, County of Alameda, Hayward, California.

Smallwood, K. S., L. Neher, and J. Mount. 2011. Monitoring Burrow Use of Wintering Burrowing Owls. SRC document P229, County of Alameda, Hayward, California.

Smallwood, K. S., L. Neher, and J. Mount. 2011. Nesting Burrowing Owl Distribution and Abundance in the Altamont Pass Wind Resource Area, California. SRC document P228, County of Alameda, Hayward, California.

Smallwood, K. S. 2011. Draft Study Design for Testing Collision Risk of Flodesign Wind Turbine in Patterson Pass Wind Farm in the Altamont Pass Wind Resource Area (APWRA). http://www.altamontsrc.org/alt_doc/p100_src_document_list_with_reference_numbers.pdf

Smallwood, K. S. 2011. Sampling Burrowing Owls Across the Altamont Pass Wind Resource Area. SRC document P205, County of Alameda, Hayward, California.

Smallwood, K. S. 2011. Proposal to Sample Burrowing Owls Across the Altamont Pass Wind Resource Area. SRC document P155, County of Alameda, Hayward, California. SRC document P198, County of Alameda, Hayward, California.

Smallwood, K. S. 2010. Comments on APWRA Monitoring Program Update. SRC document P191, County of Alameda, Hayward, California.

Smallwood, K. S. 2010. Inter-turbine Comparisons of Fatality Rates in the Altamont Pass Wind Resource Area. SRC document P189, County of Alameda, Hayward, California.

Smallwood, K. S. 2010. Review of the December 2010 Draft of M-21: Altamont Pass Wind Resource Area Bird Collision Study. SRC document P190, County of Alameda, Hayward, California.

Alameda County SRC (Shawn Smallwood, Jim Estep, Sue Orloff, Joanna Burger, and Julie Yee). Comments on the Notice of Preparation for a Programmatic Environmental Impact Report on Revised CUPs for Wind Turbines in the Alameda County portion of the Altamont Pass. SRC document P183, County of Alameda, Hayward, California.

Smallwood, K. S. 2010. Review of Monitoring Implementation Plan. SRC document P180, County of Alameda, Hayward, California.

Burger, J., J. Estep, S. Orloff, S. Smallwood, and J. Yee. 2010. SRC Comments on CalWEA Research Plan. SRC document P174, County of Alameda, Hayward, California.

Alameda County SRC (Smallwood, K. S., S. Orloff, J. Estep, J. Burger, and J. Yee). SRC Comments on Monitoring Team's Draft Study Plan for Future Monitoring. SRC document P168, County of Alameda, Hayward, California.

Smallwood, K. S. 2010. Second Review of American Kestrel-Burrowing owl (KB) Scavenger Removal Adjustments Reported in Alameda County Avian Monitoring Team's M21 for the Altamont Pass Wind Resource Area. SRC document P171, County of Alameda, Hayward, California.

Smallwood, K. S. 2010. Assessment of Three Proposed Adaptive Management Plans for Reducing Raptor Fatalities in the Altamont Pass Wind Resource Area. SRC document P161, County of Alameda, Hayward, California.

Smallwood, K. S. and J. Estep. 2010. Report of additional wind turbine hazard ratings in the Altamont Pass Wind Resource Area by Two Members of the Alameda County Scientific Review Committee. SRC document P153, County of Alameda, Hayward, California.

Smallwood, K. S. 2010. Alternatives to Improve the Efficiency of the Monitoring Program. SRC document P158, County of Alameda, Hayward, California.

- Smallwood, S. 2010. Summary of Alameda County SRC Recommendations and Concerns and Subsequent Actions. SRC document P147, County of Alameda, Hayward, California.
- Smallwood, S. 2010. Progress of Avian Wildlife Protection Program & Schedule. SRC document P148, County of Alameda, Hayward, California. SRC document P148, County of Alameda, Hayward, California.
- Smallwood, S. 2010. Old-generation wind turbines rated for raptor collision hazard by Alameda County Scientific Review Committee in 2010, an Update on those Rated in 2007, and an Update on Tier Rankings. SRC document P155, County of Alameda, Hayward, California.
- Smallwood, K. S. 2010. Review of American Kestrel-Burrowing owl (KB) Scavenger Removal Adjustments Reported in Alameda County Avian Monitoring Team's M21 for the Altamont Pass Wind Resource Area. SRC document P154, County of Alameda, Hayward, California.
- Smallwood, K. S. 2010. Fatality Rates in the Altamont Pass Wind Resource Area 1998-2009. Alameda County SRC document P-145.
- Smallwood, K. S. 2010. Comments on Revised M-21: Report on Fatality Monitoring in the Altamont Pass Wind Resource Area. SRC document P144, County of Alameda, Hayward, California.
- Smallwood, K. S. 2009. SRC document P129, County of Alameda, Hayward, California.
- Smallwood, K. S. 2009. Smallwood's review of M32. SRC document P111, County of Alameda, Hayward, California.
- Smallwood, K. S. 2009. 3rd Year Review of 16 Conditional Use Permits for Windworks, Inc. and Altamont Infrastructure Company, LLC. Comment letter to East County Board of Zoning Adjustments. 10 pp + 2 attachments.
- Smallwood, K. S. 2008. Weighing Remaining Workload of Alameda County SRC against Proposed Budget Cap. Alameda County SRC document not assigned. 3 pp.
- Alameda County SRC (Smallwood, K. S., S. Orloff, J. Estep, J. Burger, and J. Yee). 2008. SRC comments on August 2008 Fatality Monitoring Report, M21. SRC document P107, County of Alameda, Hayward, California.
- Smallwood, K. S. 2008. Burrowing owl carcass distribution around wind turbines. SRC document P106, County of Alameda, Hayward, California.
- Smallwood, K. S. 2008. Assessment of relocation/removal of Altamont Pass wind turbines rated as hazardous by the Alameda County SRC. SRC document P103, County of Alameda, Hayward, California.
- Smallwood, K. S. and L. Neher. 2008. Summary of wind turbine-free ridgelines within and around the APWRA. SRC document P102, County of Alameda, Hayward, California.

- Smallwood, K. S. and B. Karas. 2008. Comparison of mortality estimates in the Altamont Pass Wind Resource Area when restricted to recent fatalities. SRC document P101, County of Alameda, Hayward, California.
- Smallwood, K. S. 2008. On the misapplication of mortality adjustment terms to fatalities missed during one search and found later. SRC document P97, County of Alameda, Hayward, California.
- Smallwood, K. S. 2008. Relative abundance of raptors outside the APWRA. SRC document P88, County of Alameda, Hayward, California.
- Smallwood, K. S. 2008. Comparison of mortality estimates in the Altamont Pass Wind Resource Area. SRC document P76, County of Alameda, Hayward, California.
- Alameda County SRC (Smallwood, K. S., S. Orloff, J. Estep, J. Burger, and J. Yee). 2010. Guidelines for siting wind turbines recommended for relocation to minimize potential collision-related mortality of four focal raptor species in the Altamont Pass Wind Resource Area. SRC document P70, County of Alameda, Hayward, California.
- Alameda County SRC (J. Burger, Smallwood, K. S., S. Orloff, J. Estep, and J. Yee). 2007. First DRAFT of Hazardous Rating Scale. SRC document P69, County of Alameda, Hayward, California.
- Alameda County SRC (Smallwood, K. S., S. Orloff, J. Estep, J. Burger, and J. Yee). December 11, 2007. SRC selection of dangerous wind turbines. Alameda County SRC document P-67. 8 pp.
- Smallwood, S. October 6, 2007. Smallwood's answers to Audubon's queries about the SRC's recommended four-month winter shutdown of wind turbines in the Altamont Pass. Alameda County SRC document P-23.
- Smallwood, K. S. October 1, 2007. Dissenting opinion on recommendation to approve of the AWI Blade Painting Study. Alameda County SRC document P-60.
- Smallwood, K. S. July 26, 2007. Effects of monitoring duration and inter-annual variability on precision of wind-turbine caused mortality estimates in the Altamont Pass Wind Resource Area, California. SRC Document P44.
- Smallwood, K. S. July 26, 2007. Memo: Opinion of some SRC members that the period over which post-management mortality will be estimated remains undefined. SRC Document P43.
- Smallwood, K. S. July 19, 2007. Smallwood's response to P24G. SRC Document P41, 4 pp.
- Smallwood, K. S. April 23, 2007. New Information Regarding Alameda County SRC Decision of 11 April 2007 to Grant FPLE Credits for Removing and Relocating Wind Turbines in 2004. SRC Document P26.
- Alameda County SRC (Smallwood, K. S., S. Orloff, J. Estep, and J. Burger [J. Yee abstained]). April 17, 2007. SRC Statement in Support of the Monitoring Program Scope and Budget.

Smallwood, K. S. April 15, 2007. Verification of Tier 1 & 2 Wind Turbine Shutdowns and Relocations. SRC Document P22.

Smallwood, S. April 15, 2007. Progress of Avian Wildlife Protection Program & Schedule.

Alameda County SRC (Smallwood, K. S., S. Orloff, J. Estep, J. Burger, and J. Yee). April 3, 2007. Alameda County Scientific Review Committee replies to the parties' responses to its queries and to comments from the California Office of the Attorney General. SRC Document S20.

Smallwood, S. March 19, 2007. Estimated Effects of Full Winter Shutdown and Removal of Tier I & II Turbines. SRC Document S19.

Smallwood, S. March 8, 2007. Smallwood's Replies to the Parties' Responses to Queries from the SRC and Comments from the California Office of the Attorney General. SRC Document S16.

Smallwood, S. March 8, 2007. Estimated Effects of Proposed Measures to be Applied to 2,500 Wind Turbines in the APWRA Fatality Monitoring Plan. SRC Document S15.

Alameda County SRC (Smallwood, K. S., S. Orloff, J. Estep, J. Burger, and J. Yee). February 7, 2007. Analysis of Monitoring Program in Context of 1/1//2007 Settlement Agreement.

Smallwood, S. January 8, 2007. Smallwood's Concerns over the Agreement to Settle the CEQA Challenges. SRC Document S5.

Alameda County SRC (Smallwood, K. S., S. Orloff, J. Estep, J. Burger, and J. Yee). December 19, 2006. Altamont Scientific Review Committee (SRC) Recommendations to the County on the Avian Monitoring Team Consultants' Budget and Organization.

Reports to Clients

Smallwood, K. S. 223. Assessment of wildlife collision risk with third wind turbine layout of Sand Hill & Rooney Ranch Wind Farm. Report to Viracocha Wind, Bethesda Maryland, and Salka, San Diego, California.

Smallwood, K. S. and D. A. Bell. 2022. Ground squirrel abundance and repeat raptor surveys at Vasco Caves Regional Preserve, 2006–2019. Report to the East Contra Costa County Habitat Conservancy Science and Research Grant Program. 80 pp.

Smallwood, K. S. 2022c. Assessment of wildlife collision risk with second wind turbine layout of Sand Hill and Rooney Ranch Wind Farm. Report to Viracocha Wind LLC and Salka LLC.

Smallwood, K. S. 2022b. Assessment of wildlife collision risk with second wind turbine layout of Viracocha Wind Farm. Report to Viracocha Wind LLC and Salka LLC.

Smallwood, K. S. 2022. Survey for Burrow Systems of San Joaquin Kangaroo Rat (*Dipodomys nitratoides*) at Natural Resource Management Area 5, Naval Air Station, Lemoore. Report to U.S. Navy.

- Smallwood, K. S. 2022a. Assessment of wildlife collision risk with initial wind turbine layout of Viracocha Wind Farm. Report to Viracocha Wind LLC and Salka LLC.
- Smallwood, K. S. 2020. Baseline Map of California Ground Squirrel Burrow Systems on Marsh Creek Preserve. Report to East Bay Regional Park District, Oakland, California.
- Smallwood, K. S. 2020. Comparison of bird and bat fatality rates among utility-scale solar projects in California. Report to undisclosed client.
- Smallwood, K. S., D. Bell, and S. Standish. 2018. Skilled dog detections of bat and small bird carcasses in wind turbine fatality monitoring. Report to East Bay Regional Park District, Oakland, California.
- Smallwood, K. S. 2018. Addendum to Comparison of Wind Turbine Collision Hazard Model Performance: One-year Post-construction Assessment of Golden Eagle Fatalities at Golden Hills. Report to Audubon Society, NextEra Energy, and the California Attorney General.
- Smallwood, K. S., and L. Neher. 2018. Siting wind turbines to minimize raptor collisions at Sand Hill Repowering Project, Altamont Pass Wind Resource Area. Report to S-Power, Salt Lake City, Utah.
- Smallwood, K. S., and L. Neher. 2018. Siting wind turbines to minimize raptor collisions at Rooney Ranch Repowering Project, Altamont Pass Wind Resource Area. Report to S-Power, Salt Lake City, Utah.
- Smallwood, K. S. 2017. Summary of a burrowing owl conservation workshop. Report to Santa Clara Valley Habitat Agency, Morgan Hill, California.
- Smallwood, K. S., and L. Neher. 2018. Comparison of wind turbine collision hazard model performance prepared for repowering projects in the Altamont Pass Wind Resources Area. Report to NextEra Energy Resources, Inc., Office of the California Attorney General, Audubon Society, East Bay Regional Park District.
- Smallwood, K. S., and L. Neher. 2016. Siting wind turbines to minimize raptor collisions at Summit Winds Repowering Project, Altamont Pass Wind Resource Area. Report to Salka, Inc., Washington, D.C.
- Smallwood, K. S., L. Neher, and D. A. Bell. 2017. Mitigating golden eagle impacts from repowering Altamont Pass Wind Resource Area and expanding Los Vaqueros Reservoir. Report to East Contra Costa County Habitat Conservation Plan Conservancy and Contra Costa Water District.
- Smallwood, K. S. 2016. Review of avian-solar science plan. Report to Center for Biological Diversity. 28 pp
- Smallwood, K. S. 2016. Report of Altamont Pass research as Vasco Winds mitigation. Report to NextEra Energy Resources, Inc., Office of the California Attorney General, Audubon Society,

East Bay Regional Park District.

- Smallwood, K. S., and L. Neher. 2016. Siting Wind Turbines to Minimize Raptor collisions at Sand Hill Repowering Project, Altamont Pass Wind Resource Area. Report to Ogin, Inc., Waltham, Massachusetts.
- Smallwood, K. S., and L. Neher. 2015a. Siting wind turbines to minimize raptor collisions at Golden Hills Repowering Project, Altamont Pass Wind Resource Area. Report to NextEra Energy Resources, Livermore, California.
- Smallwood, K. S., and L. Neher. 2015b. Siting wind turbines to minimize raptor collisions at Golden Hills North Repowering Project, Altamont Pass Wind Resource Area. Report to NextEra Energy Resources, Livermore, California.
- Smallwood, K. S., and L. Neher. 2015c. Siting wind turbines to minimize raptor collisions at the Patterson Pass Repowering Project, Altamont Pass Wind Resource Area. Report to EDF Renewable Energy, Oakland, California.
- Smallwood, K. S., and L. Neher. 2014. Early assessment of wind turbine layout in Summit Wind Project. Report to Altamont Winds LLC, Tracy, California.
- Smallwood, K. S. 2015. Review of avian use survey report for the Longboat Solar Project. Report to EDF Renewable Energy, Oakland, California.
- Smallwood, K. S. 2014. Information needed for solar project impacts assessment and mitigation planning. Report to Panorama Environmental, Inc., San Francisco, California.
- Smallwood, K. S. 2014. Monitoring fossorial mammals in Vasco Caves Regional Preserve, California: Report of Progress for the period 2006-2014. Report to East Bay Regional Park District, Oakland, California.
- Smallwood, K. S. 2013. First-year estimates of bird and bat fatality rates at old wind turbines, Forebay areas of Altamont Pass Wind Resource Area. Report to FloDesign in support of EIR.
- Smallwood, K. S. and W. Pearson. 2013. Neotropical bird monitoring of burrowing owls (*Athene cunicularia*), Naval Air Station Lemoore, California. Tierra Data, Inc. report to Naval Air Station Lemoore.
- Smallwood, K. S. 2013. Winter surveys for San Joaquin kangaroo rat (*Dipodomys nitratooides*) and burrowing owls (*Athene cunicularia*) within Air Operations at Naval Air Station, Lemoore. Report to Tierra Data, Inc. and Naval Air Station Lemoore.
- Smallwood, K. S. and M. L. Morrison. 2013. San Joaquin kangaroo rat (*Dipodomys n. nitratooides*) conservation research in Resource Management Area 5, Lemoore Naval Air Station: 2013 Final Report (Inclusive of work during 2000-2013). Naval Facilities Engineering Command, Southwest, Desert Integrated Products Team, San Diego, California.
- Smallwood, K. S. and M. L. Morrison. 2013. San Joaquin kangaroo rat (*Dipodomys n. nitratooides*)

- conservation research in Resource Management Area 5, Lemoore Naval Air Station: 2012 Progress Report (Inclusive of work during 2000-2012). Naval Facilities Engineering Command, Southwest, Desert Integrated Products Team, San Diego, California.
- Smallwood, K. S. 2012. Fatality rate estimates at the Vantage Wind Energy Project, year one. Report to Ventus Environmental, Portland, Oregon.
- Smallwood, K. S. and L. Neher. 2012. Siting wind turbines to minimize raptor collisions at North Sky River. Report to NextEra Energy Resources, LLC.
- Smallwood, K. S. 2011. Monitoring Fossorial Mammals in Vasco Caves Regional Preserve, California: Report of Progress for the Period 2006-2011. Report to East Bay Regional Park District.
- Smallwood, K. S. and M. L. Morrison. 2011. San Joaquin kangaroo rat (*Dipodomys n. nitratooides*) Conservation Research in Resource Management Area 5, Lemoore Naval Air Station: 2011 Progress Report (Inclusive of work during 2000-2011). Naval Facilities Engineering Command, Southwest, Desert Integrated Products Team, San Diego, California.
- Smallwood, K. S. 2011. Draft study design for testing collision risk of FloDesign Wind Turbine in Patterson Pass, Santa Clara, and Former AES Seawest Wind Projects in the Altamont Pass Wind Resource Area (APWRA). Report to FloDesign, Inc.
- Smallwood, K. S. 2011. Comments on Marbled Murrelet collision model for the Radar Ridge Wind Resource Area. Report to EcoStat, Inc., and ultimately to US Fish and Wildlife Service.
- Smallwood, K. S. 2011. Avian fatality rates at Buena Vista Wind Energy Project, 2008-2011. Report to Pattern Energy.
- Smallwood, K. S. and L. Neher. 2011. Siting repowered wind turbines to minimize raptor collisions at Tres Vaqueros, Contra Costa County, California. Report to Pattern Energy.
- Smallwood, K. S. and M. L. Morrison. 2011. San Joaquin kangaroo rat (*Dipodomys n. nitratooides*) Conservation Research in Resource Management Area 5, Lemoore Naval Air Station: 2010 Progress Report (Inclusive of work during 2000-2010). Naval Facilities Engineering Command, Southwest, Desert Integrated Products Team, San Diego, California.
- Smallwood, K. S. 2010. Wind Energy Development and avian issues in the Altamont Pass, California. Report to Black & Veatch.
- Smallwood, K. S. and L. Neher. 2010. Siting repowered wind turbines to minimize raptor collisions at the Tres Vaqueros Wind Project, Contra Costa County, California. Report to the East Bay Regional Park District, Oakland, California.
- Smallwood, K. S. and L. Neher. 2010. Siting repowered wind turbines to minimize raptor collisions at Vasco Winds. Report to NextEra Energy Resources, LLC, Livermore, California.
- Smallwood, K. S. 2010. Baseline avian and bat fatality rates at the Tres Vaqueros Wind Project,

- Contra Costa County, California. Report to the East Bay Regional Park District, Oakland, California.
- Smallwood, K. S. and M. L. Morrison. 2010. San Joaquin kangaroo rat (*Dipodomys n. nitratooides*) Conservation Research in Resource Management Area 5, Lemoore Naval Air Station: 2009 Progress Report (Inclusive of work during 2000-2009). Naval Facilities Engineering Command, Southwest, Desert Integrated Products Team, San Diego, California. 86 pp.
- Smallwood, K. S. 2009. Mammal surveys at naval outlying landing field Imperial Beach, California, August 2009. Report to Tierra Data, Inc. 5 pp
- Smallwood, K. S. 2009. Mammals and other Wildlife Observed at Proposed Site of Amargosa Solar Power Project, Spring 2009. Report to Tierra Data, Inc. 13 pp
- Smallwood, K. S. 2009. Avian Fatality Rates at Buena Vista Wind Energy Project, 2008-2009. Report to members of the Contra Costa County Technical Advisory Committee on the Buena Vista Wind Energy Project. 8 pp.
- Smallwood, K. S. 2009. Repowering the Altamont Pass Wind Resource Area more than Doubles Energy Generation While Substantially Reducing Bird Fatalities. Report prepared on behalf of Californians for Renewable Energy. 2 pp.
- Smallwood, K. S. and M. L. Morrison. 2009. Surveys to Detect Salt Marsh Harvest Mouse and California Black Rail at Installation Restoration Site 30, Military Ocean Terminal Concord, California: March-April 2009. Report to Insight Environmental, Engineering, and Construction, Inc., Sacramento, California. 6 pp.
- Smallwood, K. S. 2008. Avian and Bat Mortality at the Big Horn Wind Energy Project, Klickitat County, Washington. Unpublished report to Friends of Skamania County. 7 pp.
- Smallwood, K. S. 2009. Monitoring Fossorial Mammals in Vasco Caves Regional Preserve, California: report of progress for the period 2006-2008. Unpublished report to East Bay Regional Park District. 5 pp.
- Smallwood, K. S. and M. L. Morrison. 2008. San Joaquin kangaroo rat (*Dipodomys n. nitratooides*) Conservation Research in Resource Management Area 5, Lemoore Naval Air Station: 2008 Progress Report (Inclusive of work during 2000-2008). Naval Facilities Engineering Command, Southwest, Desert Integrated Products Team, San Diego, California. 84 pp.
- Smallwood, K. S. and M. L. Morrison. 2008. Habitat Assessment for California Red-Legged Frog at Naval Weapons Station, Seal Beach, Detachment Concord, California. Naval Facilities Engineering Command, Southwest, Desert Integrated Products Team, San Diego, California. 48 pp.
- Smallwood, K. S. and B. Nakamoto. 2008. Impact of 2005 and 2006 West Nile Virus on Yellow-billed Magpie and American Crow in the Sacramento Valley, California. 22 pp.
- Smallwood, K. S. and M. L. Morrison. 2008. Former Naval Security Group Activity (NSGA),

- Skaggs Island, Waste and Contaminated Soil Removal Project (IR Site #2), San Pablo Bay, Sonoma County, California: Re-Vegetation Monitoring. Report to U.S. Navy, Letter Agreement – N68711-04LT-A0045. Naval Facilities Engineering Command, Southwest, Desert Integrated Products Team, San Diego, California. 10 pp.
- Smallwood, K. S. and M. L. Morrison. 2008. Burrowing owls at Dixon Naval Radio Transmitter Facility. Report to U.S. Navy. Naval Facilities Engineering Command, Southwest, Desert Integrated Products Team, San Diego, California. 28 pp.
- Smallwood, K. S. and M. L. Morrison. 2008. San Joaquin kangaroo rat (*Dipodomys n. nitratooides*) Conservation Research in Resource Management Area 5, Lemoore Naval Air Station: 2007 Progress Report (Inclusive of work during 2001-2007). Naval Facilities Engineering Command, Southwest, Desert Integrated Products Team, San Diego, California. 69 pp.
- Smallwood, K. S. and M. L. Morrison. 2007. A Monitoring Effort to Detect the Presence of the Federally Listed Species California Clapper Rail and Salt Marsh Harvest Mouse, and Wetland Habitat Assessment at the Naval Weapons Station, Seal Beach, Detachment Concord, California. Installation Restoration (IR) Site 30, Final Report to U.S. Navy, Letter Agreement – N68711-05LT-A0001. U.S. Navy Integrated Product Team (IPT), West, Naval Facilities Engineering Command, San Diego, California. 8 pp.
- Smallwood, K. S. and M. L. Morrison. 2007. San Joaquin kangaroo rat (*Dipodomys n. nitratooides*) Conservation Research in Resource Management Area 5, Lemoore Naval Air Station: 2006 Progress Report (Inclusive of work during 2001-2006). U.S. Navy Integrated Product Team (IPT), West, Naval Facilities Engineering Command, Southwest, Daly City, California. 165 pp.
- Smallwood, K. S. and C. Thelander. 2006. Response to third review of Smallwood and Thelander (2004). Report to California Institute for Energy and Environment, University of California, Oakland, CA. 139 pp.
- Smallwood, K. S. 2006. Biological effects of repowering a portion of the Altamont Pass Wind Resource Area, California: The Diablo Winds Energy Project. Report to Altamont Working Group. Available from Shawn Smallwood, puma@yolo.com . 34 pp.
- Smallwood, K. S. 2006. Impact of 2005 West Nile Virus on yellow-billed magpie and american crow in the Sacramento Valley, California. Report to Sacramento-Yolo Mosquito and Vector Control District, Elk Grove, CA. 38 pp.
- Smallwood, K. S. and M. L. Morrison. 2006. San Joaquin kangaroo rat (*Dipodomys n. nitratooides*) Conservation Research in Resource Management Area 5, Lemoore Naval Air Station: 2005 Progress Report (Inclusive of work during 2001-2005). U.S. Navy Integrated Product Team (IPT), West, Naval Facilities Engineering Command, South West, Daly City, California. 160 pp.
- Smallwood, K. S. and M. L. Morrison. 2006. A monitoring effort to detect the presence of the federally listed species California tiger salamander and California red-legged frog at the Naval Weapons Station, Seal Beach, Detachment Concord, California. Letter agreements N68711-04LT-A0042 and N68711-04LT-A0044, U.S. Navy Integrated Product Team (IPT), West, Naval Facilities Engineering Command, South West, Daly City, California. 60 pp.

Smallwood, K. S. and M. L. Morrison. 2006. A monitoring effort to detect the presence of the federally listed species California Clapper Rail and Salt Marsh Harvest Mouse, and wetland habitat assessment at the Naval Weapons Station, Seal Beach, Detachment Concord, California. Sampling for rails, Spring 2006, Installation Restoration (IR) Site 1. Letter Agreement – N68711-05lt-A0001, U.S. Navy Integrated Product Team (IPT), West, Naval Facilities Engineering Command, South West, Daly City, California. 9 pp.

Morrison, M. L. and K. S. Smallwood. 2006. Final Report: Station-wide Wildlife Survey, Naval Air Station, Lemoore. Department of the Navy Integrated Product Team (IPT) West, Naval Facilities Engineering Command Southwest, 2001 Junipero Serra Blvd., Suite 600, Daly City, CA 94014-1976. 20 pp.

Smallwood, K. S. and M. L. Morrison. 2006. Former Naval Security Group Activity (NSGA), Skaggs Island, Waste and Contaminated Soil Removal Project, San Pablo Bay, Sonoma County, California: Re-vegetation Monitoring. Department of the Navy Integrated Product Team (IPT) West, Naval Facilities Engineering Command Southwest, 2001 Junipero Serra Blvd., Suite 600, Daly City, CA 94014-1976. 8 pp.

Dorin, Melinda, Linda Spiegel and K. Shawn Smallwood. 2005. Response to public comments on the staff report entitled *Assessment of Avian Mortality from Collisions and Electrocutions* (CEC-700-2005-015) (Avian White Paper) written in support of the 2005 Environmental Performance Report and the 2005 Integrated Energy Policy Report. California Energy Commission, Sacramento. 205 pp.

Smallwood, K. S. 2005. Estimating combined effects of selective turbine removal and winter-time shutdown of half the wind turbines. Unpublished CEC staff report, June 23. 1 p.

Erickson, W. and S. Smallwood. 2005. Avian and Bat Monitoring Plan for the Buena Vista Wind Energy Project Contra Costa County, California. Unpubl. report to Contra Costa County, Antioch, California. 22 pp.

Lamphier-Gregory, West Inc., Shawn Smallwood, Jones & Stokes Associates, Illingworth & Rodkin Inc. and Environmental Vision. 2005. Environmental Impact Report for the Buena Vista Wind Energy Project, LP# 022005. County of Contra Costa Community Development Department, Martinez, California.

Morrison, M. L. and K. S. Smallwood. 2005. A monitoring effort to detect the presence of the federally listed species California clapper rail and salt marsh harvest mouse, and wetland habitat assessment at the Naval Weapons Station, Seal Beach, Detachment Concord, California. Targeted Sampling for Salt Marsh Harvest Mouse, Fall 2005 Installation Restoration (IR) Site 30. Letter Agreement – N68711-05lt-A0001, U.S. Department of the Navy, Naval Facilities Engineering Command Southwest, Daly City, California. 6 pp.

Morrison, M. L. and K. S. Smallwood. 2005. A monitoring effort to detect the presence of the federally listed species California clapper rail and salt marsh harvest mouse, and wetland habitat assessment at the Naval Weapons Station, Seal Beach, Detachment Concord, California. Letter Agreement – N68711-05lt-A0001, U.S. Department of the Navy, Naval Facilities Engineering

- Command Southwest, Daly City, California. 5 pp.
- Morrison, M. L. and K. S. Smallwood. 2005. Skaggs Island waste and contaminated soil removal projects, San Pablo Bay, Sonoma County, California. Report to the U.S. Department of the Navy, Naval Facilities Engineering Command Southwest, Daly City, California. 6 pp.
- Smallwood, K. S. and M. L. Morrison. 2004. 2004 Progress Report: San Joaquin kangaroo rat (*Dipodomys nitratooides*) Conservation Research in Resources Management Area 5, Lemoore Naval Air Station. Progress report to U.S. Department of the Navy, Lemoore, California. 134 pp.
- Smallwood, K. S. and L. Spiegel. 2005a. Assessment to support an adaptive management plan for the APWRA. Unpublished CEC staff report, January 19. 19 pp.
- Smallwood, K. S. and L. Spiegel. 2005b. Partial re-assessment of an adaptive management plan for the APWRA. Unpublished CEC staff report, March 25. 48 pp.
- Smallwood, K. S. and L. Spiegel. 2005c. Combining biology-based and policy-based tiers of priority for determining wind turbine relocation/shutdown to reduce bird fatalities in the APWRA. Unpublished CEC staff report, June 1. 9 pp.
- Smallwood, K. S. 2004. Alternative plan to implement mitigation measures in APWRA. Unpublished CEC staff report, January 19. 8 pp.
- Smallwood, K. S., and L. Neher. 2005. Repowering the APWRA: Forecasting and minimizing avian mortality without significant loss of power generation. California Energy Commission, PIER Energy-Related Environmental Research. CEC-500-2005-005. 21 pp. [Reprinted (in Japanese) in Yukihiro Kominami, Tatsuya Ura, Koshitawa, and Tsuchiya, Editors, Wildlife and Wind Turbine Report 5. Wild Bird Society of Japan, Tokyo.]
- Morrison, M. L., and K. S. Smallwood. 2004. Kangaroo rat survey at RMA4, NAS Lemoore. Report to U.S. Navy. 4 pp.
- Morrison, M. L., and K. S. Smallwood. 2004. A monitoring effort to detect the presence of the federally listed species California clapper rails and wetland habitat assessment at Pier 4 of the Naval Weapons Station, Seal Beach, Detachment Concord, California. Letter Agreement N68711-04LT-A0002. 8 pp. + 2 pp. of photo plates.
- Smallwood, K. S. and M. L. Morrison. 2003. 2003 Progress Report: San Joaquin kangaroo rat (*Dipodomys nitratooides*) Conservation Research at Resources Management Area 5, Lemoore Naval Air Station. Progress report to U.S. Department of the Navy, Lemoore, California. 56 pp. + 58 figures.
- Smallwood, K. S. 2003. Comparison of Biological Impacts of the No Project and Partial Underground Alternatives presented in the Final Environmental Impact Report for the Jefferson-Martin 230 kV Transmission Line. Report to California Public Utilities Commission. 20 pp.
- Morrison, M. L., and K. S. Smallwood. 2003. Kangaroo rat survey at RMA4, NAS Lemoore.

- Report to U.S. Navy. 6 pp. + 7 photos + 1 map.
- Smallwood, K. S. 2003. Assessment of the Environmental Review Documents Prepared for the Tesla Power Project. Report to the California Energy Commission on behalf of Californians for Renewable Energy. 32 pp.
- Smallwood, K. S., and M. L. Morrison. 2003. 2002 Progress Report: San Joaquin kangaroo rat (*Dipodomys nitratooides*) Conservation Research at Resources Management Area 5, Lemoore Naval Air Station. Progress report to U.S. Department of the Navy, Lemoore, California. 45 pp. + 36 figures.
- Smallwood, K. S., Michael L. Morrison and Carl G. Thelander 2002. Study plan to test the effectiveness of aerial markers at reducing avian mortality due to collisions with transmission lines: A report to Pacific Gas & Electric Company. 10 pp.
- Smallwood, K. S. 2002. Assessment of the Environmental Review Documents Prepared for the East Altamont Energy Center. Report to the California Energy Commission on behalf of Californians for Renewable Energy. 26 pp.
- Thelander, Carl G., K. Shawn Smallwood, and Christopher Costello. 2002 Rating Distribution Poles for Threat of Raptor Electrocutation and Priority Retrofit: Developing a Predictive Model. Report to Southern California Edison Company. 30 pp.
- Smallwood, K. S., M. Robison, and C. Thelander. 2002. Draft Natural Environment Study, Prunedale Highway 101 Project. California Department of Transportation, San Luis Obispo, California. 120 pp.
- Smallwood, K.S. 2001. Assessment of ecological integrity and restoration potential of Beeman/Pelican Farm. Draft Report to Howard Beeman, Woodland, California. 14 pp.
- Smallwood, K. S., and M. L. Morrison. 2002. Fresno kangaroo rat (*Dipodomys nitratooides*) Conservation Research at Resources Management Area 5, Lemoore Naval Air Station. Progress report to U.S. Department of the Navy, Lemoore, California. 29 pp. + 19 figures.
- Smallwood, K.S. 2001. Rocky Flats visit, April 4th through 6th, 2001. Report to Berger & Montaque, P.C. 16 pp. with 61 color plates.
- Smallwood, K.S. 2001. Affidavit of K. Shawn Smallwood, Ph.D. in the matter of the U.S. Fish and Wildlife Service's rejection of Seatuck Environmental Association's proposal to operate an education center on Seatuck National Wildlife Refuge. Submitted to Seatuck Environmental Association in two parts, totaling 7 pp.
- Magney, D., and K.S. Smallwood. 2001. Maranatha High School CEQA critique. Comment letter submitted to Tamara & Efren Compeán, 16 pp.
- Smallwood, K. S. and D. Mangey. 2001. Comments on the Newhall Ranch November 2000 Administrative Draft EIR. Prepared for Ventura County Counsel regarding the Newhall Ranch Specific Plan EIR. 68 pp.

- Magney, D. and K. S. Smallwood. 2000. Newhall Ranch Notice of Preparation Submittal. Prepared for Ventura County Counsel regarding our recommended scope of work for the Newhall Ranch Specific Plan EIR. 17 pp.
- Smallwood, K. S. 2000. Comments on the Preliminary Staff Assessment of the Contra Costa Power Plant Unit 8 Project. Submitted to California Energy Commission on November 30 on behalf of Californians for Renewable Energy (CaRE). 4 pp.
- Smallwood, K. S. 2000. Comments on the California Energy Commission's Final Staff Assessment of the MEC. Submitted to California Energy Commission on October 29 on behalf of Californians for Renewable Energy (CaRE). 8 pp.
- Smallwood, K. S. 2000. Comments on the Biological Resources Mitigation Implementation and Monitoring Plan (BRMIMP). Submitted to California Energy Commission on October 29 on behalf of Californians for Renewable Energy (CaRE). 9 pp.
- Smallwood, K. S. 2000. Comments on the Preliminary Staff Assessment of the Metcalf Energy Center. Submitted to California Energy Commission on behalf of Californians for Renewable Energy (CaRE). 11 pp.
- Smallwood, K. S. 2000. Preliminary report of reconnaissance surveys near the TRW plant south of Phoenix, Arizona, March 27-29. Report prepared for Hagens, Berman & Mitchell, Attorneys at Law, Phoenix, AZ. 6 pp.
- Morrison, M. L., K. S. Smallwood, and M. Robison. 2001. Draft Natural Environment Study for Highway 46 compliance with CEQA/NEPA. Report to the California Department of Transportation. 75 pp.
- Morrison, M.L., and K.S. Smallwood. 1999. NTI plan evaluation and comments. Exhibit C in W.D. Carrier, M.L. Morrison, K.S. Smallwood, and Vail Engineering. Recommendations for NBHCP land acquisition and enhancement strategies. Northern Territories, Inc., Sacramento.
- Smallwood, K. S. 1999. Estimation of impacts due to dredging of a shipping channel through Humboldt Bay, California. Court Declaration prepared on behalf of EPIC.
- Smallwood, K. S. 1998. 1998 California mountain lion track count. Report to the Defenders of Wildlife, Washington, D.C. 5 pages.
- Smallwood, K.S. 1998. Draft report of a visit to a paint sludge dump site near Ridgewood, New Jersey, February 26th, 1998. Unpublished report to Consulting in the Public Interest.
- Smallwood, K.S. 1997. Science missing in the "no surprises" policy. Commissioned by National Endangered Species Network and Spirit of the Sage Council, Pasadena, California.
- Smallwood, K.S. and M.L. Morrison. 1997. Alternate mitigation strategy for incidental take of giant garter snake and Swainson's hawk as part of the Natomas Basin Habitat Conservation Plan. Pages 6-9 and *iii* illustrations in W.D. Carrier, K.S. Smallwood and M.L. Morrison,

- Natomas Basin Habitat Conservation Plan: Narrow channel marsh alternative wetland mitigation. Northern Territories, Inc., Sacramento.
- Smallwood, K.S. 1996. Assessment of the BIOPORT model's parameter values for pocket gopher burrowing characteristics. Report to Berger & Montague, P.C. and Roy S. Haber, P.C., Philadelphia. (peer reviewed).
- Smallwood, K.S. 1997. Assessment of plutonium releases from Hanford buried waste sites. Report Number 9, Consulting in the Public Interest, 53 Clinton Street, Lambertville, New Jersey, 08530.
- Smallwood, K.S. 1996. Soil Bioturbation and Wind Affect Fate of Hazardous Materials that were Released at the Rocky Flats Plant, Colorado. Report to Berger & Montague, P.C., Philadelphia.
- Smallwood, K.S. 1996. Second assessment of the BIOPORT model's parameter values for pocket gopher burrowing characteristics and other relevant wildlife observations. Report to Berger & Montague, P.C. and Roy S. Haber, P.C., Philadelphia.
- Smallwood, K.S., and R. Leidy. 1996. Wildlife and their management under the Martell SYP. Report to Georgia Pacific, Corporation, Martel, CA. 30 pp.
- EIP Associates. 1995. Yolo County Habitat Conservation Plan Biological Resources Report. Yolo County Planning and Development Department, Woodland, California.
- Smallwood, K.S. and S. Geng. 1995. Analysis of the 1987 California Farm Cost Survey and recommendations for future survey. Program on Workable Energy Regulation, University-wide Energy Research Group, University of California.
- Smallwood, K.S., S. Geng, and W. Idzerda. 1992. Final report to PG&E: Analysis of the 1987 California Farm Cost Survey and recommendations for future survey. Pacific Gas & Electric Company, San Ramon, California. 24 pp.
- Fitzhugh, E.L. and K.S. Smallwood. 1987. Methods Manual – A statewide mountain lion population index technique. California Department of Fish and Game, Sacramento.
- Salmon, T.P. and K.S. Smallwood. 1989. Final Report – Evaluating exotic vertebrates as pests to California agriculture. California Department of Food and Agriculture, Sacramento.
- Smallwood, K.S. and W. A. Erickson (written under supervision of W.E. Howard, R.E. Marsh, and R.J. Laacke). 1990. Environmental exposure and fate of multi-kill strychnine gopher baits. Final Report to USDA Forest Service –NAPIAP, Cooperative Agreement PSW-89-0010CA.
- Fitzhugh, E.L., K.S. Smallwood, and R. Gross. 1985. Mountain lion track count, Marin County, 1985. Report on file at Wildlife Extension, University of California, Davis.

Comments on Environmental Documents (Year; pages)

I was retained or commissioned to comment on environmental planning and review documents,

including:

- Ashley Warehouse Environmental Checklist, Lathrop (2023; 38);
- Replies on 6615 Pacific Coast Highway Site Plan Review, Long Beach (2023; 12)
- Science Research Park Expansion Project EIR Addendum, San Diego (2023; 40);
- Rubio Village IS/MND, San Gabriel (2023; 14);
- Havana Investment Industrial Categorical Exemption, Jurupa Valley (2023; 22);
- New Cal Centre EIR Addendum, Kern County (2023; 39);
- 4th & Hewitt Project DEIR, Los Angeles (2023; 19);
- 4260 N Arch Drive Categorical Exemption, Los Angeles (2023; 27);
- 6700 Pacific Coast Highway Site Plan Review, Long Beach (2023; 29);
- Replies to 6615 Pacific Coast Highway Site Plan Review, Long Beach (2023; 12);
- 6615 Pacific Coast Highway Site Plan Review, Long Beach (2023; 34);
- Moonlight Apartments biological assessment, Encinitas (2023; 46);
- Replies to Modera Melrose Mixed-use DEIR, Oceanside (2023; 11);
- Modera Melrose Mixed-use DEIR, Oceanside (2023; 39);
- 550 Piercy Road Industrial IS/MND, San Jose (2023; 28);
- Living Spaces Development IS/MND, Fresno (2023; 28);
- FIND Food Bank Staff Report, Indio (2023; 19);
- Replies to Shadowbox Studios DEIR, Santa Clarita (2023; 35);
- Shadowbox Studios DEIR, Santa Clarita (2023; 50);
- Tulare 40 Generation Facility IS/MND, Tulare County (2023; 20);
- Garden Street Hotel Staff Report, Santa Barbara (2023; 19);
- Replies to 975 Manhattan Apartments Discretionary Approval, Los Angeles (2023; 10);
- 975 Manhattan Apartments Discretionary Approval, Los Angeles (2023; 12);
- 6th visit Veterans Affairs Site Plan Review No. 20-0102 MND, Bakersfield (2023; 14);
- Coachella Airport Business Park IS/MND, Coachella (2023; 31);
- 3400 Tecate Warehouse Staff Report, Camarillo (2023; 26);
- Green Valley III Apartments DEIR, Fairfield (2023; 50);
- Pacific Specific Plan DEIR, San Marcos (2023; 55);
- Amara Bay Mixed Use Staff Report, Chula Vista (2023; 46);
- Greenlaw Partners Warehouse IS, Fresno (2023; 23);
- PODS Warehouse IS/MND, Desert Hot Springs (2023; 30);
- 6th visit Veterans Affairs Site Plan Review No. 20-0102 MND, Bakersfield (2023; 9);
- Replies on Ormat Brawley Solar Project DEIR, Brawley (2023; 80);
- One Hamilton as part of City of Mill Valley's 2023-2031 Housing Element Update DSEIR (2023; 31);
- Second letter on Shinohara Project IS/MND, Chula Vista (2023; 22);
- 3890 Depot Road Project IS/MND, Hayward (2023; 33);
- Wellprofit Wellness Mixed-use project CEQA Exemption, Temecula (2023; 31);
- Quail Meadows Apartments CEQA Exemption, Encinitas (2023; 55);
- RCCB Fresno Distribution Center Notice of Exemption, Fresno (2022; 14);
- Stoddard Wells Industrial Project IS/MND, City of Victorville (2022; 31);
- 16454 Adelanto Road Warehouse Distribution Facility Class 32 Categorical Exemption,

- Adelanto (2022; 17);
- Replies on Pure Water Project – Las Virgenes-Triunfo Joint Powers Authority FPEIR, Agoura (2022; 26);
- Desert Gateway MND Addendum, Desert Hot Springs (2022; 35);
- Blue Oaks Commerce Center MND Addendum, City of Roseville (2022; 12);
- Replies on Coachillin Amendment to Specific Plan, Desert Hot Springs (2022; 24);
- Island View Mixed-Use CEQA Compliance Memo, City of Rancho Cucamonga (2022; 17);
- Prairie Station Apartments IS/MND, City of Inglewood (2022; 32);
- Golden Land Warehouse CEQA Exemption, City of Rialto (2022; 12);
- South Juarez Street Design Review, Banning (2022; 17);
- Replies on Pentair Expansion Industrial Warehouse FMND, Moorpark (2022; 13);
- 2nd Replies on Greentree FEIR, Vacaville (2022; 16);
- Replies on Temporary Outdoor Vehicle Storage FEIR, Port of Hueneme (2022; 21);
- National City-Bayfront, San Diego DEIR (2022; 56);
- Goshen Community Plan General Plan Amendment & Addendum (2022, 6);
- Primrose and Adelanto warehouse Categorical Exemption, Adelanto (2022, 14);
- TenTen Hollywood Categorical Exclusion (2022, 17);
- Waste to Hydrogen project IS/MND, Lancaster (2022, 36);
- Las Virgenes-Triunfo Pure Water Project <Agoura Hills, (2022; 43);
- Shinohara Project IS/MND, Chula Vista (2022; 30);
- Marlborough-Northgate Warehouse IS/MND, Riverside (2022; 33);
- Meyers Ave, Warehouse IS/MND, Escondido IS/MND (2022; 27);
- Northgate Industrial Park IS/MND, Sacramento (2022; 28);
- Ramona-Indian Warehouse IS/MND, Perris (2022; 44);
- Norwalk Entertainment District EIR (2022; 29);
- Breeze Luxury Apartments IS/MND, Oceanside (2022; 40);
- Paso Commons Golden Hills Commerce Center IS/MND, Paso Robles (2022; 35);
- YS Industrial Park Application, Visalia (2022; 20);
- Pentair Expansion Industrial Warehouse IS/MND, Moorpark (2022; 28);
- Salvador Solar IS/MND, Riverside (2022; 27);
- Fresno General Plan Amendment 555 IS/MND (2022; 21);
- 570 Crespi Drive IS/MND, Pacifica (2022; 40);
- Renaissance Ranch Commerce Center DEIR, Temescal Valley (2022; 53);
- Replies on Glen Ivy Senior Living IS/MND, Temescal Valley (2022; 24);
- Glen Ivy Senior Living IS/MND, Temescal Valley (2022; 46);
- FedEx Distribution Warehouse IS, Lancaster (2022; 35);
- Urban Villages EIR Addendum, San Marcos (2022; 32);
- NextEra San Ardos Solar IS/ND, San Ardo (2022; 20);
- Summit Avenue Warehouse IS/MND, Fontana (2022; 28);
- Gateway at the Oaks DEIR, Thousand Oaks (2022; 30);
- Primrose and Adelanto Warehouse CEQA Exemption, Adelanto (2022; 11);
- Fore Apartments Staff Report, Oxnard (2022; 29);
- 975 Manhattan Rd. discretionary approval, Los Angeles (2022; 12);
- Coachillin DEIR, North Palm Springs (2022; 30);

- 2740 W. Nielsen Ave Warehouse IS/MND, Fresno (2022; 25);
- Golf Center Warehouse Staff Report, Indio (2022; 26);
- Desert Peak Energy IS/MND, Palm Springs (2022; 26);
- Replies on Greentree FEIR, Vacaville (2022; 13);
- Greentree DEIR, Vacaville (2022; 31);
- Town Center DEIR, Laguna Niguel (2022; 16);
- 2nd Replies on Freedom Circle Focus Area and Greystar General Plan Amendment Project FEIR, San Jose (2022; 3);
- Corydon III CEQA Categorical Exemption, Lake Elsinore (2022; 11);
- Park Edge Apartments IS/MND, Santa Maria (2022; 30);
- Replies on UCSF New Hospital FEIR at Parnassus Heights FEIR. San Francisco (2022; 13);
- Replies on North Central Valley BESS Project IS/MND, Stockton (2022; 21);
- 9248 Holly Road Cannabis CEQA Exemption, Adelanto (2022; 12);
- Replies on Amazing 34 Distribution Center IS/MND, San Bernardino (2022; 10);
- Amazing 34 Distribution Center IS/MND, San Bernardino (2022; 28);
- Replies on Freedom Circle Focus Area and Greystar General Plan Amendment Project FEIR, San Jose (2022; 5);
- Replies on Alviso Hotel Project IS/MND, San Jose (2022; 49);
- Bussetto Foods IS/ND, Fresno (2022; 34);
- Spruce Ave Commerce Center, Rialto (2022;);
- 5006 and 5010 Mission Boulevard Warehouse IS/MND, Montclair (2022; 18);
- Conejo Summit IS/MND, Thousand Oaks (2022; 28);
- Sixth visit, Veterans Affairs Site Plan Review No. 20-0102 MND, Bakersfield (2022; 4);
- TC NO. CAL. Development Warehousing and Distribution Facility Project DEIR, Stockton (2022; 33);
- Replies on Davidon Homes FEIR, Petaluma (2022; 49);
- Rural preservation and net conservation benefit coalition reply to post hearing briefs, Garnet Solar (2022; 24);
- Garnet Solar direct testimony, New York (2022; 17);
- Fifth visit, Veterans Affairs Site Plan Review No. 20-0102 MND, Bakersfield (2022; 11);
- Shirk & Riggin Industrial Park Application, Visalia (2022; 22);
- Duarte Industrial Application, Visalia (2022; 17);
- Amond World Cold Storage Warehouse IS/MND, Madera (2022; 23);
- Replies on Schulte Logistics Centre EIR, Tracy (2022; 28);
- Alta Cuvee Mixed Use Project Recirculated IS/MND, Ranch Cucamonga (2022; 8);
- Fourth visit, Veterans Affairs Site Plan Review No. 20-0102 MND, Bakersfield (2022; 9);
- Replies on 1242 20th Street Wellness Center Project FEIR, Santa Monica (2022; 5);
- 656 South San Vicente Medical Office Project EIR, Los Angeles (2022; 21);
- UCSF New Hospital at Parnassus Heights DEIR. San Francisco (2022; 40);
- DPR-21-021 Warehouse IS, Modesto (2022; 19);
- Ormat Brawley Solar Project DEIR, Brawley (2022; 37);
- Site visits to Heber 1 Geothermal Repower Project IS/MND (2022; 31);
- Heritage Industrial Center Design Review, Chula Vista (2022; 13);
- Temporary Outdoor Vehicle Storage DEIR, Port of Hueneme (2022; 31);

- CNU Medical Center and Innovation Park DEIR, Natomas (2022; 35);
- Beverly Boulevard Warehouse IS/MND, Pico Rivera (2021; 28);
- Hagemon Properties IS/MND Amendment, Bakersfield (2022; 23);
- Airport Distribution Center IS/MND, Redding (2021; 22);
- Orchard on Nevada Warehouse Staff Report, Redlands (2021; 24);
- Landings Logistics Center Exemption, Bakersfield (2021; 19);
- Replies on Hearn Veterans Village IS/MND, Santa Rosa (2021; 22);
- North Central Valley BESS Project IS/MND, Stockton (2021; 39);
- 2nd Replies on Heber 1 Geothermal Repower Project IS/MND (2022; 21);
- Stagecoach Solar DEIR, Barstow (2021; 24);
- Updated Sun Lakes Village North EIR Amendment 5, Banning, Riverside County (2021; 35);
- Freedom Circle Focus Area and Greystar General Plan Amendment Project EIR, San Jose (2021; 43);
- Operon HKI Warehouse IS/MND, Perris (2021; 26);
- Fairway Business Park Phase III IS/MND, Lake Elsinore (2021; 23);
- South Stockton Commerce Center IS/MND, Stockton (2021; 31);
- Starpoint Warehouse IS/MND, San Bernardino (2021; 24);
- Replies on Heber 1 Geothermal Repower Project IS/MND (2021; 15);
- Heber 1 Geothermal Repower Project IS/MND (2021; 11);
- Alviso Hotel Project IS/MND, San Jose (2021; 43);
- Replies on Easton Research Park West IS/MND, Rancho Cordova (2021; 3);
- Easton Research Park West IS/MND, Rancho Cordova (2021; 31);
- US Cold Storage DEIR, Hesperia (2021; 30);
- 1242 20th Street Wellness Center Project FEIR, Santa Monica (2021; 23);
- Third visit, Veterans Affairs Site Plan Review No. 20-0102 MND, Bakersfield (2021; 10);
- Roseland Creek Community Park Project IS/MND, Santa Rosa (2021; 23);
- Vista Mar Declaration of Irreparable Harm, Pacifica (2021; 3);
- LogistiCenter at Fairfield IS/MND (2021; 25);
- Alta Cuvee Mixed Use Project IS/MND, Ranch Cucamonga (2021; 29);
- Caligrows Architectural and Site Plan Review, Patterson (2021; 21);
- 1055 E. Sandhill Avenue Warehouse IS/MND, Carson (2021; 10);
- Chestnut & Tenth Street Commercial Project IS/MND, Gilroy (2021; 27);
- Libitzky Management Warehouse IS/MND, Modesto (2021; 20);
- 3rd Replies on Heber 2 Geothermal Repower Project IS/MND, El Centro (2021; 10);
- Medical Office Building DEIR, Santa Cruz (2021; 30);
- Scannell Warehouse DEIR, Richmond (2021; 24);
- Diamond Heights Application, San Francisco (2021; 24);
- Costa Azul Mixed-Use EIR Addendum, San Diego (2021; 25);
- Woodland Research Park DEIR (2021; 45);
- 2nd Replies on Diamond Street Industrial IS/MND, San Marcos (2021; 9);
- Replies on Diamond Street Industrial IS/MND, San Marcos (2021; 3);
- Diamond Street Industrial IS/MND, San Marcos (2021; 28);
- DHS 109 Industrial Park IS/MND, Desert Hot Springs (2021; 33);

- Jersey Industrial Complex Rancho Cucamonga (2022; 22);
- 1188 Champions Drive Parking Garage Staff Report, San Jose (2021; 5);
- San Pedro Mountain, Pacifica (2021; 22);
- Pixior Warehouse IS/MND, Hesperia (2021; 29);
- 2nd Replies on Heber 2 Geothermal Repower Project IS/MND, El Centro (2021; 9);
- Hearn Veterans Village IS/MND, Santa Rosa (2021; 23);
- Second visit, Veterans Affairs Site Plan Review No. 20-0102 MND, Bakersfield (2021; 11);
- Replies on Station East Residential/Mixed Use EIR, Union City (2021; 26);
- Schulte Logistics Centre EIR, Tracy (2021; 30);
- 4150 Point Eden Way Industrial Development EIR, Hayward (2021; 13);
- Airport Business Centre IS/MND, Manteca (2021; 27);
- Dual-branded Hotel IS/MND, Santa Clara (2021; 26);
- Legacy Highlands Specific Plan EIR, Beaumont (2021; 47);
- UC Berkeley LRDP and Housing Projects #1 and #2 EIR (2021; 27);
- Santa Maria Airport Business Park EIR, Santa Maria (2021; 27);
- Replies on Coachella Valley Arena EIR Addendum, Thousand Palms (2021; 20);
- Coachella Valley Arena EIR Addendum, Thousand Palms (2021; 35);
- Inland Harbor Warehouse NOD, Ontario (2021; 8);
- Alvarado Specific Plan DEIR, La Mesa (2021; 35);
- Harvill Avenue and Rider Street Terminal Project MND, Riverside (2021; 23);
- Gillespie Field EIR Addendum, El Cajon (2021; 28);
- Heritage Wind Energy Project section 94-c siting process, New York (2021: 99);
- Commercial Street Hotels project Site Plans, Oakland (2021; 19);
- Heber 1 Geothermal Repower Project MND, El Centro (2021; 11);
- Citrus-Slover Warehouse Project MND, Fontana (2021; 20);
- Scott Ranch Project RDEIR (Davidon Homes), Petaluma (2021; 31);
- Replies on StratosFuel Renewable H2 Project MND, Victorville (2021; 5);
- StratosFuel Renewable H2 Project MND, Victorville (2021; 25);
- Replies on PARS Global Storage MND, Murietta (2021; 22);
- Baldwin-Zacharias Master Plans EIR, Patterson (2021; 38);
- 1000 Gibraltar Drive EIR, Milpitas (2021; 20);
- Mango Avenue Industrial Warehouse Project, Fontana, MND (2021; 20);
- Veterans Affairs Site Plan Review No. 20-0102 MND, Bakersfield (2021; 25);
- Replies on UCSF Comprehensive Parnassus Heights Plan EIR (2021; 13);
- 14 Charles Hill Circle Design Review (2021; 11);
- SDG Commerce 217 Warehouse IS, American Canyon (2021; 26);
- Mulqueeney Ranch Wind Repowering Project DSEIR (2021; 98);
- Clawiter Road Industrial Project IS/MND, Hayward (2021; 18);
- Garnet Energy Center Stipulations, New York (2020);
- Heritage Wind Energy Project, New York (2020: 71);
- Ameresco Keller Canyon RNG Project IS/MND, Martinez (2020; 11);
- Cambria Hotel Project Staff Report, Dublin (2020; 19);
- Central Pointe Mixed-Use Staff Report, Santa Ana (2020; 20);
- Oak Valley Town Center EIR Addendum, Calimesa (2020; 23);

- Coachillin Specific Plan MND Amendment, Desert Hot Springs (2020; 26);
- Stockton Avenue Hotel and Condominiums Project Tiering to EIR, San Jose (2020; 19);
- Cityline Sub-block 3 South Staff Report, Sunnyvale (2020; 22);
- Station East Residential/Mixed Use EIR, Union City (2020; 21);
- Multi-Sport Complex & Southeast Industrial Annexation Suppl. EIR, Elk Grove (2020; 24);
- Sun Lakes Village North EIR Amendment 5, Banning, Riverside County (2020; 27);
- 2nd comments on 1296 Lawrence Station Road, Sunnyvale (2020; 4);
- 1296 Lawrence Station Road, Sunnyvale (2020; 16);
- Mesa Wind Project EA, Desert Hot Springs (2020; 31);
- 11th Street Development Project IS/MND, City of Upland (2020; 17);
- Vista Mar Project IS/MND, Pacifica (2020; 17);
- Emerson Creek Wind Project Application, Ohio (2020; 64);
- Replies on Wister Solar Energy Facility EIR, Imperial County (2020; 12);
- Wister Solar Energy Facility EIR, Imperial County (2020; 28);
- Crimson Solar EIS/EIR, Mojave Desert (2020, 35) not submitted;
- Sakioka Farms EIR tiering, Oxnard (2020; 14);
- 3440 Wilshire Project IS/MND, Los Angeles (2020; 19);
- Replies on 2400 Barranca Office Development Project EIR, Irvine (2020; 8);
- 2400 Barranca Office Development Project EIR, Irvine (2020; 25);
- Replies on Heber 2 Geothermal Repower Project IS/MND, El Centro (2020; 4);
- 2nd comments on Heber 2 Geothermal Repower Project IS/MND, El Centro (2020; 8);
- Heber 2 Geothermal Repower Project IS/MND, El Centro (2020; 3);
- Lots 4-12 Oddstad Way Project IS/MND, Pacifica (2020; 16);
- Declaration on DDG Visalia Warehouse project (2020; 5);
- Terraces of Lafayette EIR Addendum (2020; 24);
- AMG Industrial Annex IS/MND, Los Banos (2020; 15);
- Replies to responses on Casmalia and Linden Warehouse, Rialto (2020; 15);
- Clover Project MND, Petaluma (2020; 27);
- Ruby Street Apartments Project Env. Checklist, Hayward (2020; 20);
- Replies to responses on 3721 Mt. Diablo Boulevard Staff Report (2020; 5);
- 3721 Mt. Diablo Boulevard Staff Report (2020; 9);
- Steeno Warehouse IS/MND, Hesperia (2020; 19);
- UCSF Comprehensive Parnassus Heights Plan EIR (2020; 24);
- North Pointe Business Center MND, Fresno (2020; 14);
- Casmalia and Linden Warehouse IS, Fontana (2020; 15);
- Rubidoux Commerce Center Project IS/MND, Jurupa Valley (2020; 27);
- Haun and Holland Mixed Use Center MND, Menifee (2020; 23);
- First Industrial Logistics Center II, Moreno Valley IS/MND (2020; 23);
- GLP Store Warehouse Project Staff Report (2020; 15);
- Replies on Beale WAPA Interconnection Project EA & CEQA checklist (2020; 29);
- 2nd comments on Beale WAPA Interconnection Project EA & CEQA checklist (2020; 34);
- Beale WAPA Interconnection Project EA & CEQA checklist (2020; 30);
- Levine-Fricke Softball Field Improvement Addendum, UC Berkeley (2020; 16);
- Greenlaw Partners Warehouse and Distribution Center Staff Report, Palmdale (2020; 14);

- Humboldt Wind Energy Project DEIR (2019; 25);
- Sand Hill Supplemental EIR, Altamont Pass (2019; 17);
- 1700 Dell Avenue Office Project, Campbell (2019, 28);
- 1180 Main Street Office Project MND, Redwood City (2019; 19);
- Summit Ridge Wind Farm Request for Amendment 4, Oregon (2019; 46);
- Shafter Warehouse Staff Report (2019; 4);
- Park & Broadway Design Review, San Diego (2019; 19);
- Pinnacle Pacific Heights Design Review, San Diego (2019; 19);
- Pinnacle Park & C Design Review, San Diego (2019; 19);
- Preserve at Torrey Highlands EIR, San Diego (2019; 24);
- Santana West Project EIR Addendum, San Jose (2019; 18);
- The Ranch at Eastvale EIR Addendum, Riverside County (2020; 19);
- Hageman Warehouse IS/MND, Bakersfield (2019; 13);
- Oakley Logistics Center EIR, Antioch (2019; 22);
- 27 South First Street IS, San Jose (2019; 23);
- 2nd replies on Times Mirror Square Project EIR, Los Angeles (2020; 11);
- Replies on Times Mirror Square Project EIR, Los Angeles (2020; 13);
- Times Mirror Square Project EIR, Los Angeles (2019; 18);
- East Monte Vista & Aviator General Plan Amend EIR Addendum, Vacaville (2019; 22);
- Hillcrest LRDP EIR, La Jolla (2019; 36);
- 555 Portola Road CUP, Portola Valley (2019; 11);
- Johnson Drive Economic Development Zone SEIR, Pleasanton (2019; 27);
- 1750 Broadway Project CEQA Exemption, Oakland (2019; 19);
- Mor Furniture Project MND, Murietta Hot Springs (2019; 27);
- Harbor View Project EIR, Redwood City (2019; 26);
- Visalia Logistics Center (2019; 13);
- Cordelia Industrial Buildings MND (2019; 14);
- Scheu Distribution Center IS/ND, Rancho Cucamonga (2019; 13);
- Mills Park Center Staff Report, San Bruno (2019; 22);
- Site visit to Desert Highway Farms IS/MND, Imperial County (2019; 9);
- Desert Highway Farms IS/MND, Imperial County (2019; 12);
- ExxonMobil Interim Trucking for Santa Ynez Unit Restart SEIR, Santa Barbara (2019; 9);
- Olympic Holdings Inland Center Warehouse Project MND, Rancho Cucamonga (2019; 14);
- Replies to responses on Lawrence Equipment Industrial Warehouse, Banning (2019; 19);
- PARS Global Storage MND, Murietta (2019; 13);
- Slover Warehouse EIR Addendum, Fontana (2019; 16);
- Seefried Warehouse Project IS/MND, Lathrop (2019; 19)
- World Logistics Center Site Visit, Moreno Valley (2019; 19);
- Merced Landfill Gas-To-Energy Project IS/MND (2019; 12);
- West Village Expansion FEIR, UC Davis (2019; 11);
- Site visit, Doheny Ocean Desalination EIR, Dana Point (2019; 11);
- Replies to responses on Avalon West Valley Expansion EIR, San Jose (2019; 10);
- Avalon West Valley Expansion EIR, San Jose (2019; 22);
- Sunroad – Otoy 50 EIR Addendum, San Diego (2019; 26);

- Del Rey Pointe Residential Project IS/MND, Los Angeles (2019; 34);
- 1 AMD Redevelopment EIR, Sunnyvale (2019; 22);
- Lawrence Equipment Industrial Warehouse IS/MND, Banning (2019; 14);
- SDG Commerce 330 Warehouse IS, American Canyon (2019; 21);
- PAMA Business Center IS/MND, Moreno Valley (2019; 23);
- Cupertino Village Hotel IS (2019; 24);
- Lake House IS/ND, Lodi (2019; 33);
- Campo Wind Project DEIS, San Diego County (DEIS, (2019; 14);
- Stirling Warehouse MND site visit, Victorville (2019; 7);
- Green Valley II Mixed-Use Project EIR, Fairfield (2019; 36);
- We Be Jammin rezone MND, Fresno (2019; 14);
- Gray Whale Cove Pedestrian Crossing IS/ND, Pacifica (2019; 7);
- Visalia Logistics Center & DDG 697V Staff Report (2019; 9);
- Mather South Community Masterplan Project EIR (2019; 35);
- Del Hombro Apartments EIR, Walnut Creek (2019; 23);
- Otay Ranch Planning Area 12 EIR Addendum, Chula Vista (2019; 21);
- The Retreat at Sacramento IS/MND (2019; 26);
- Site visit to Sunroad – Centrum 6 EIR Addendum, San Diego (2019; 9);
- Sunroad – Centrum 6 EIR Addendum, San Diego (2018; 22);
- North First and Brokaw Corporate Campus Buildings EIR Addendum, San Jose (2018; 30);
- South Lake Solar IS, Fresno County (2018; 18);
- Galloo Island Wind Project Application, New York (not submitted) (2018; 44);
- Doheny Ocean Desalination EIR, Dana Point (2018; 15);
- Stirling Warehouse MND, Victorville (2018; 18);
- LDK Warehouse MND, Vacaville (2018; 30);
- Gateway Crossings FEIR, Santa Clara (2018; 23);
- South Hayward Development IS/MND (2018; 9);
- CBU Specific Plan Amendment, Riverside (2018; 27);
- 2nd replies to responses on Dove Hill Road Assisted Living Project MND (2018; 11);
- Replies to responses on Dove Hill Road Assisted Living Project MND (2018; 7);
- Dove Hill Road Assisted Living Project MND (2018; 12);
- Deer Ridge/Shadow Lakes Golf Course EIR, Brentwood (2018; 21);
- Pyramid Asphalt BLM Finding of No Significance, Imperial County (2018; 22);
- Amáre Apartments IS/MND, Martinez (2018; 15);
- Petaluma Hill Road Cannabis MND, Santa Rosa (2018; 21);
- 2nd comments on Zeiss Innovation Center IS/MND, Dublin (2018; 12);
- Zeiss Innovation Center IS/MND, Dublin (2018; 32);
- City of Hope Campus Plan EIR, Duarte (2018; 21);
- Palo Verde Center IS/MND, Blythe (2018; 14);
- Logisticenter at Vacaville MND (2018; 24);
- IKEA Retail Center SEIR, Dublin (2018; 17);
- Merge 56 EIR, San Diego (2018; 15);
- Natomas Crossroads Quad B Office Project P18-014 EIR, Sacramento (2018; 12);
- 2900 Harbor Bay Parkway Staff Report, Alameda (2018; 30);

- At Dublin EIR, Dublin (2018; 25);
- Fresno Industrial Rezone Amendment Application No. 3807 IS (2018; 10);
- Nova Business Park IS/MND, Napa (2018; 18);
- Updated Collision Risk Model Priors for Estimating Eagle Fatalities, USFWS (2018; 57);
- 750 Marlborough Avenue Warehouse MND, Riverside (2018; 14);
- Replies to responses on San Bernardino Logistics Center IS (2018; 12);
- San Bernardino Logistics Center IS (2018; 19);
- CUP2017-16, Costco IS/MND, Clovis (2018; 11);
- Desert Land Ventures Specific Plan EIR, Desert Hot Springs (2018; 18);
- Ventura Hilton IS/MND (2018; 30);
- North of California Street Master Plan Project IS, Mountain View (2018: 11);
- Tamarind Warehouse MND, Fontana (2018; 16);
- Lathrop Gateway Business Park EIR Addendum (2018; 23);
- Centerpointe Commerce Center IS, Moreno Valley (2019; 18);
- Amazon Warehouse Notice of Exemption, Bakersfield (2018; 13);
- CenterPoint Building 3 project Staff Report, Manteca (2018; 23);
- Cessna & Aviator Warehouse IS/MND, Vacaville (2018; 24);
- Napa Airport Corporate Center EIR, American Canyon (2018, 15);
- 800 Opal Warehouse Initial Study, Mentone, San Bernardino County (2018; 18);
- 2695 W. Winton Ave Industrial Project IS, Hayward (2018; 22);
- Trinity Cannabis Cultivation and Manufacturing Facility DEIR, Calexico (2018; 15);
- Shoe Palace Expansion IS/MND, Morgan Hill (2018; 21);
- Newark Warehouse at Morton Salt Plant Staff Report (2018; 15);
- Northlake Specific Plan FEIR “Peer Review”, Los Angeles County (2018; 9);
- Replies to responses on Northlake Specific Plan SEIR, Los Angeles County (2018; 13);
- Northlake Specific Plan SEIR, Los Angeles County (2017; 27);
- Bogle Wind Turbine DEIR, east Yolo County (2017; 48);
- Ferrante Apartments IS/MND, Los Angeles (2017; 14);
- The Villages of Lakeview EIR, Riverside (2017; 28);
- Data Needed for Assessing Trail Management Impacts on Northern Spotted Owl, Marin County (2017; 5);
- Notes on Proposed Study Options for Trail Impacts on Northern Spotted Owl (2017; 4);
- Pyramid Asphalt IS, Imperial County (Declaration) (2017; 5);
- San Geronio Crossings EIR, Riverside County (2017; 22);
- Replies to responses on Jupiter Project IS and MND, Apple Valley (2017; 12);
- Proposed World Logistics Center Mitigation Measures, Moreno Valley (2017, 2019; 12);
- MacArthur Transit Village Project Modified 2016 CEQA Analysis (2017; 12);
- PG&E Company Bay Area Operations and Maintenance HCP (2017; 45);
- Central SoMa Plan DEIR (2017; 14);
- Suggested mitigation for trail impacts on northern spotted owl, Marin County (2016; 5);
- Colony Commerce Center Specific Plan DEIR, Ontario (2016; 16);
- Fairway Trails Improvements MND, Marin County (2016; 13);
- Review of Avian-Solar Science Plan (2016; 28);
- Replies on Pyramid Asphalt IS, Imperial County (2016; 5);

- Pyramid Asphalt IS, Imperial County (2016; 4);
- Agua Mansa Distribution Warehouse Project Initial Study (2016; 14);
- Santa Anita Warehouse MND, Rancho Cucamonga (2016; 12);
- CapRock Distribution Center III DEIR, Rialto (2016: 12);
- Orange Show Logistics Center IS/MND, San Bernardino (2016; 9);
- City of Palmdale Oasis Medical Village Project IS/MND (2016; 7);
- Comments on proposed rule for incidental eagle take, USFWS (2016, 49);
- Replies on Grapevine Specific and Community Plan FEIR, Kern County (2016; 25);
- Grapevine Specific and Community Plan DEIR, Kern County (2016; 15);
- Clinton County Zoning Ordinance for Wind Turbine siting (2016);
- Hallmark at Shenandoah Warehouse Project Initial Study, San Bernardino (2016; 6);
- Tri-City Industrial Complex Initial Study, San Bernardino (2016; 5);
- Hidden Canyon Industrial Park Plot Plan 16-PP-02, Beaumont (2016; 12);
- Kimball Business Park DEIR (2016; 10);
- Jupiter Project IS and MND, Apple Valley, San Bernardino County (2016; 9);
- Revised Draft Giant Garter Snake Recovery Plan of 2015 (2016, 18);
- Palo Verde Mesa Solar Project EIR, Blythe (2016; 27);
- Reply on Fairview Wind Project Natural Heritage Assessment, Ontario, Canada (2016; 14);
- Fairview Wind Project Natural Heritage Assessment, Ontario, Canada (2016; 41);
- Reply on Amherst Island Wind Farm Natural Heritage Assessment, Ontario (2015, 38);
- Amherst Island Wind Farm Natural Heritage Assessment, Ontario (2015, 31);
- Second Reply on White Pines Wind Farm, Ontario (2015, 6);
- Reply on White Pines Wind Farm Natural Heritage Assessment, Ontario (2015, 10);
- White Pines Wind Farm Natural Heritage Assessment, Ontario (2015, 9);
- Proposed Section 24 Specific Plan Agua Caliente Band of Cahuilla Indians DEIS (2015, 9);
- Replies on 24 Specific Plan Agua Caliente Band of Cahuilla Indians FEIS (2015, 6);
- Sierra Lakes Commerce Center Project DEIR, Fontana (2015, 9);
- Columbia Business Center MND, Riverside (2015; 8);
- West Valley Logistics Center Specific Plan DEIR, Fontana (2015, 10);
- Willow Springs Solar Photovoltaic Project DEIR (2015, 28);
- Alameda Creek Bridge Replacement Project DEIR (2015, 10);
- World Logistic Center Specific Plan FEIR, Moreno Valley (2015, 12);
- Elkhorn Valley Wind Power Project Impacts, Oregon (2015; 143);
- Bay Delta Conservation Plan EIR/EIS, Sacramento (2014, 21);
- Addison Wind Energy Project DEIR, Mojave (2014, 32);
- Replies on the Addison Wind Energy Project DEIR, Mojave (2014, 15);
- Addison and Rising Tree Wind Energy Project FEIR, Mojave (2014, 12);
- Palen Solar Electric Generating System FSA (CEC), Blythe (2014, 20);
- Rebuttal testimony on Palen Solar Energy Generating System (2014, 9);
- Seven Mile Hill and Glenrock/Rolling Hills impacts + Addendum, Wyoming (2014; 105);
- Rising Tree Wind Energy Project DEIR, Mojave (2014, 32);
- Replies on the Rising Tree Wind Energy Project DEIR, Mojave (2014, 15);
- Soitec Solar Development Project PEIR, Boulevard, San Diego County (2014, 18);
- Oakland Zoo expansion on Alameda whipsnake and California red-legged frog (2014; 3);

- Alta East Wind Energy Project FEIS, Tehachapi Pass (2013, 23);
- Blythe Solar Power Project Staff Assessment, California Energy Commission (2013, 16);
- Clearwater and Yakima Solar Projects DEIR, Kern County (2013, 9);
- West Antelope Solar Energy Project IS/MND, Antelope Valley (2013, 18);
- Cuyama Solar Project DEIR, Carrizo Plain (2014, 19);
- Desert Renewable Energy Conservation Plan (DRECP) EIR/EIS (2015, 49);
- Kingbird Solar Photovoltaic Project EIR, Kern County (2013, 19);
- Lucerne Valley Solar Project IS/MND, San Bernardino County (2013, 12);
- Tule Wind project FEIR/FEIS (Declaration) (2013; 31);
- Sunlight Partners LANDPRO Solar Project MND (2013; 11);
- Declaration in opposition to BLM fracking (2013; 5);
- Blythe Energy Project (solar) CEC Staff Assessment (2013;16);
- Rosamond Solar Project EIR Addendum, Kern County (2013; 13);
- Pioneer Green Solar Project EIR, Bakersfield (2013; 13);
- Replies on Soccer Center Solar Project MND (2013; 6);
- Soccer Center Solar Project MND, Lancaster (2013; 10);
- Plainview Solar Works MND, Lancaster (2013; 10);
- Alamo Solar Project MND, Mojave Desert (2013; 15);
- Replies on Imperial Valley Solar Company 2 Project (2013; 10);
- Imperial Valley Solar Company 2 Project (2013; 13);
- FRV Orion Solar Project DEIR, Kern County (PP12232) (2013; 9);
- Casa Diablo IV Geothermal Development Project (2013; 6);
- Reply on Casa Diablo IV Geothermal Development Project (2013; 8);
- Alta East Wind Project FEIS, Tehachapi Pass (2013; 23);
- Metropolitan Air Park DEIR, City of San Diego (2013;);
- Davidon Homes Tentative Subdivision Rezoning Project DEIR, Petaluma (2013; 9);
- Oakland Zoo Expansion Impacts on Alameda Whipsnake (2013; 10);
- Campo Verde Solar project FEIR, Imperial Valley (2013; 11pp);
- Neg Dec comments on Davis Sewer Trunk Rehabilitation (2013; 8);
- North Steens Transmission Line FEIS, Oregon (Declaration) (2012; 62);
- Summer Solar and Springtime Solar Projects IS/MND Lancaster (2012; 8);
- J&J Ranch, 24 Adobe Lane Environmental Review, Orinda (2012; 14);
- Replies on Hudson Ranch Power II Geothermal Project and Simbol Calipatria Plant II (2012; 8);
- Hudson Ranch Power II Geothermal Project and Simbol Calipatria Plant II (2012; 9);
- Desert Harvest Solar Project EIS, near Joshua Tree (2012; 15);
- Solar Gen 2 Array Project DEIR, El Centro (2012; 16);
- Ocotillo Sol Project EIS, Imperial Valley (2012; 4);
- Beacon Photovoltaic Project DEIR, Kern County (2012; 5);
- Butte Water District 2012 Water Transfer Program IS/MND (2012; 11);
- Mount Signal and Calxico Solar Farm Projects DEIR (2011; 16);
- City of Elk Grove Sphere of Influence EIR (2011; 28);
- Sutter Landing Park Solar Photovoltaic Project MND, Sacramento (2011; 9);
- Rabik/Gudath Project, 22611 Coleman Valley Road, Bodega Bay (CPN 10-0002) (2011; 4);

- Ivanpah Solar Electric Generating System (ISEGS) (Declaration) (2011; 9);
- Draft Eagle Conservation Plan Guidance, USFWS (2011; 13);
- Niles Canyon Safety Improvement Project EIR/EA (2011; 16);
- Route 84 Safety Improvement Project (Declaration) (2011; 7);
- Rebuttal on Whistling Ridge Wind Energy Power DEIS, Skamania County, (2010; 6);
- Whistling Ridge Wind Energy Power DEIS, Skamania County, Washington (2010; 41);
- Klickitat County's Decisions on Windy Flats West Wind Energy Project (2010; 17);
- St. John's Church Project DEIR, Orinda (2010; 14);
- Results Radio Zone File #2009-001 IS/MND, Conaway site, Davis (2010; 20);
- Rio del Oro Specific Plan Project FEIR, Rancho Cordova (2010;12);
- Results Radio Zone File #2009-001, Mace Blvd site, Davis (2009; 10);
- Answers to Questions on 33% RPS Implementation Analysis Preliminary Results Report (2009; 9);
- SEPA Determination of Non-significance regarding zoning adjustments for Skamania County, Washington (Second Declaration) (2008; 17);
- Draft 1A Summary Report to CAISO (2008; 10);
- Hilton Manor Project Categorical Exemption, County of Placer (2009; 9);
- Protest of CARE to Amendment to the Power Purchase and Sale Agreement for Procurement of Eligible Renewable Energy Resources Between Hatchet Ridge Wind LLC and PG&E (2009; 3);
- Tehachapi Renewable Transmission Project EIR/EIS (2009; 142);
- Delta Shores Project EIR, south Sacramento (2009; 11 + addendum 2);
- Declaration in Support of Care's Petition to Modify D.07-09-040 (2008; 3);
- The Public Utility Commission's Implementation Analysis December 16 Workshop for the Governor's Executive Order S-14-08 to implement a 33% Renewable Portfolio Standard by 2020 (2008; 9);
- The Public Utility Commission's Implementation Analysis Draft Work Plan for the Governor's Executive Order S-14-08 to implement a 33% Renewable Portfolio Standard by 2020 (2008; 11);
- Draft 1A Summary Report to California Independent System Operator for Planning Reserve Margins (PRM) Study (2008; 7.);
- SEPA Determination of Non-significance regarding zoning adjustments for Skamania County, Washington (Declaration) (2008; 16);
- Colusa Generating Station, California Energy Commission PSA (2007; 24);
- Rio del Oro Specific Plan Project Recirculated DEIR, Mather (2008: 66);
- Replies on Regional University Specific Plan EIR, Roseville (2008; 20);
- Regional University Specific Plan EIR, Roseville (2008: 33);
- Clark Precast, LLC's "Sugarland" project, ND, Woodland (2008: 15);
- Cape Wind Project DEIS, Nantucket (2008; 157);
- Yuba Highlands Specific Plan EIR, Spenceville, Yuba County (2006; 37);
- Replies to responses on North Table Mountain MND, Butte County (2006; 5);
- North Table Mountain MND, Butte County (2006; 15);
- Windy Point Wind Farm EIS (2006; 14 and Powerpoint slide replies);
- Shiloh I Wind Power Project EIR, Rio Vista (2005; 18);
- Buena Vista Wind Energy Project NOP, Byron (2004; 15);

- Callahan Estates Subdivision ND, Winters (2004; 11);
- Winters Highlands Subdivision IS/ND (2004; 9);
- Winters Highlands Subdivision IS/ND (2004; 13);
- Creekside Highlands Project, Tract 7270 ND (2004; 21);
- Petition to California Fish and Game Commission to list Burrowing Owl (2003; 10);
- Altamont Pass Wind Resource Area CUP renewals, Alameda County (2003; 41);
- UC Davis Long Range Development Plan: Neighborhood Master Plan (2003; 23);
- Anderson Marketplace Draft Environmental Impact Report (2003; 18);
- Negative Declaration of the proposed expansion of Temple B'nai Tikyah (2003; 6);
- Antonio Mountain Ranch Specific Plan Public Draft EIR (2002; 23);
- Replies on East Altamont Energy Center evidentiary hearing (2002; 9);
- Revised Draft Environmental Impact Report, The Promenade (2002; 7);
- Recirculated Initial Study for Calpine's proposed Pajaro Valley Energy Center (2002; 3);
- UC Merced -- Declaration (2002; 5);
- Replies on Atwood Ranch Unit III Subdivision FEIR (2003; 22);
- Atwood Ranch Unit III Subdivision EIR (2002; 19);
- California Energy Commission Staff Report on GWF Tracy Peaker Project (2002; 20);
- Silver Bend Apartments IS/MND, Placer County (2002; 13);
- UC Merced Long-range Development Plan DEIR and UC Merced Community Plan DEIR (2001; 26);
- Colusa County Power Plant IS, Maxwell (2001; 6);
- Dog Park at Catlin Park, Folsom, California (2001; 5);
- Calpine and Bechtel Corporations' Biological Resources Implementation and Monitoring Program (BRMIMP) for the Metcalf Energy Center (2000; 10);
- Metcalf Energy Center, California Energy Commission FSA (2000);
- US Fish and Wildlife Service Section 7 consultation with the California Energy Commission regarding Calpine and Bechtel Corporations' Metcalf Energy Center (2000; 4);
- California Energy Commission's Preliminary Staff Assessment of the proposed Metcalf Energy Center (2000: 11);
- Site-specific management plans for the Natomas Basin Conservancy's mitigation lands, prepared by Wildlands, Inc. (2000: 7);
- Affidavit of K. Shawn Smallwood in Spirit of the Sage Council, et al. (Plaintiffs) vs. Bruce Babbitt, Secretary, U.S. Department of the Interior, et al. (Defendants), Injuries caused by the No Surprises policy and final rule which codifies that policy (1999: 9).
- California Board of Forestry's proposed amended Forest Practices Rules (1999);
- Sunset Sky ranch Airport Use Permit IS/MND (1999);
- Ballona West Bluffs Project Environmental Impact Report (1999; oral presentation);
- Draft Recovery Plan for Giant Garter Snake (Fed. Reg. 64(176): 49497-49498) (1999; 8);
- Draft Recovery Plan for Arroyo Southwestern Toad (1998);
- Pacific Lumber Co. (Headwaters) HCP & EIR, Fortuna (1998; 28);
- Natomas Basin HCP Permit Amendment, Sacramento (1998);
- San Diego Multi-Species Conservation Program FEIS/FEIR (1997; 10);

Volunteer comments on other Environmental Review Documents:

- Proposed Regulation for California Fish and Game Code Section 3503.5 (2015: 12);
- Statement of Overriding Considerations related to extending Altamont Winds, Inc.'s Conditional Use Permit PLN2014-00028 (2015; 8);
- Covell Village PEIR, Davis (2005; 19);
- Bureau of Land Management Wind Energy Programmatic EIS Scoping (2003; 7.);
- NEPA Environmental Analysis for Biosafety Level 4 National Biocontainment Laboratory (NBL) at UC Davis (2003: 7);
- Notice of Preparation of UC Merced Community and Area Plan EIR, on behalf of The Wildlife Society—Western Section (2001: 8.);
- Preliminary Draft Yolo County Habitat Conservation Plan (2001; 2 letters totaling 35.);
- Merced County General Plan Revision, notice of Negative Declaration (2001: 2.);
- Notice of Preparation of Campus Parkway EIR/EIS (2001: 7.);
- Draft Recovery Plan for the bighorn sheep in the Peninsular Range (*Ovis candensis*) (2000);
- Draft Recovery Plan for the California Red-legged Frog (*Rana aurora draytonii*), on behalf of The Wildlife Society—Western Section (2000: 10.);
- Sierra Nevada Forest Plan Amendment Draft Environmental Impact Statement, on behalf of The Wildlife Society—Western Section (2000: 7.);
- State Water Project Supplemental Water Purchase Program, Draft Program EIR (1997);
- Davis General Plan Update EIR (2000);
- Turn of the Century EIR (1999: 10);
- Proposed termination of Critical Habitat Designation under the Endangered Species Act (Fed. Reg. 64(113): 31871-31874) (1999);
- NOA Draft Addendum to the Final Handbook for Habitat Conservation Planning and Incidental Take Permitting Process, termed the HCP 5-Point Policy Plan (Fed. Reg. 64(45): 11485 - 11490) (1999; 2 + attachments);
- Covell Center Project EIR and EIR Supplement (1997).

Position Statements I prepared the following position statements for the Western Section of The Wildlife Society, and one for nearly 200 scientists:

- Recommended that the California Department of Fish and Game prioritize the extermination of the introduced southern water snake in northern California. The Wildlife Society--Western Section (2001);
- Recommended that The Wildlife Society—Western Section appoint or recommend members of the independent scientific review panel for the UC Merced environmental review process (2001);
- Opposed the siting of the University of California's 10th campus on a sensitive vernal pool/grassland complex east of Merced. The Wildlife Society--Western Section (2000);
- Opposed the legalization of ferret ownership in California. The Wildlife Society--Western Section (2000);
- Opposed the Proposed "No Surprises," "Safe Harbor," and "Candidate Conservation Agreement" rules, including permit-shield protection provisions (Fed. Reg. Vol. 62, No. 103, pp. 29091-29098 and No. 113, pp. 32189-32194). This statement was signed by 188 scientists and went to the responsible federal agencies, as well as to the U.S. Senate and House of Representatives.

Posters at Professional Meetings

Leyvas, E. and K. S. Smallwood. 2015. Rehabilitating injured animals to offset and rectify wind project impacts. Conference on Wind Energy and Wildlife Impacts, Berlin, Germany, 9-12 March 2015.

Smallwood, K. S., J. Mount, S. Standish, E. Leyvas, D. Bell, E. Walther, B. Karas. 2015. Integrated detection trials to improve the accuracy of fatality rate estimates at wind projects. Conference on Wind Energy and Wildlife Impacts, Berlin, Germany, 9-12 March 2015.

Smallwood, K. S. and C. G. Thelander. 2005. Lessons learned from five years of avian mortality research in the Altamont Pass WRA. AWEA conference, Denver, May 2005.

Neher, L., L. Wilder, J. Woo, L. Spiegel, D. Yen-Nakafugi, and K.S. Smallwood. 2005. Bird's eye view on California wind. AWEA conference, Denver, May 2005.

Smallwood, K. S., C. G. Thelander and L. Spiegel. 2003. Toward a predictive model of avian fatalities in the Altamont Pass Wind Resource Area. Windpower 2003 Conference and Convention, Austin, Texas.

Smallwood, K.S. and Eva Butler. 2002. Pocket Gopher Response to Yellow Star-thistle Eradication as part of Grassland Restoration at Decommissioned Mather Air Force Base, Sacramento County, California. White Mountain Research Station Open House, Barcroft Station.

Smallwood, K.S. and Michael L. Morrison. 2002. Fresno kangaroo rat (*Dipodomys nitratoides*) Conservation Research at Resources Management Area 5, Lemoore Naval Air Station. White Mountain Research Station Open House, Barcroft Station.

Smallwood, K.S. and E.L. Fitzhugh. 1989. Differentiating mountain lion and dog tracks. Third Mountain Lion Workshop, Prescott, AZ.

Smith, T. R. and K. S. Smallwood. 2000. Effects of study area size, location, season, and allometry on reported *Sorex* shrew densities. Annual Meeting of the Western Section of The Wildlife Society.

Presentations at Professional Meetings and Seminars

Smallwood, K.S. Ecology and recent population trend of burrowing owls in the Altamont Pass Wind Resource Area. The Wildlife Society – Western Section Burrowing Owl Symposium, Riverside, California, 6 February 2023.

Smallwood, K.S. Renewable energy impacts to burrowing owls. The Wildlife Society – Western Section Burrowing Owl Symposium, Riverside, California, 7 February 2023.

Smallwood, K.S. and D.A. Bell. Long-Term Population Trend of Burrowing Owls in Vasco Caves. Via Zoom to Audubon Society, 21 October 2021.

Long-Term Population Trend of Burrowing Owls in the Altamont. Golden Gate Audubon, 21 October 2020.

Long-Term Population Trend of Burrowing Owls in the Altamont. East Bay Regional Park District 2020 Stewardship Seminar, Oakland, California, 18 November 2020.

Smallwood, K.S., D.A. Bell, and S. Standish. Dogs detect larger wind energy effects on bats and birds. The Wildlife Society, 28 September 2020.

Smallwood, K.S. and D.A. Bell. Effects of wind turbine curtailment on bird and bat fatalities in the Altamont Pass Wind Resource Area. The Wildlife Society, 28 September 2020.

Smallwood, K.S., D.A. Bell, and S. Standish. Dogs detect larger wind energy effects on bats and birds. The Wildlife Survey, 7 February 2020.

Smallwood, K.S. and D.A. Bell. Effects of wind turbine curtailment on bird and bat fatalities in the Altamont Pass Wind Resource Area. The Wildlife Survey, 7 February 2020.

Dog detections of bat and bird fatalities at wind farms in the Altamont Pass Wind Resource Area. East Bay Regional Park District 2019 Stewardship Seminar, Oakland, California, 13 November 2019.

Repowering the Altamont Pass. Altamont Symposium, The Wildlife Society – Western Section, 5 February 2017.

Developing methods to reduce bird mortality in the Altamont Pass Wind Resource Area, 1999-2007. Altamont Symposium, The Wildlife Society – Western Section, 5 February 2017.

Conservation and recovery of burrowing owls in Santa Clara Valley. Santa Clara Valley Habitat Agency, Newark, California, 3 February 2017.

Mitigation of Raptor Fatalities in the Altamont Pass Wind Resource Area. Raptor Research Foundation Meeting, Sacramento, California, 6 November 2015.

From burrows to behavior: Research and management for burrowing owls in a diverse landscape. California Burrowing Owl Consortium meeting, 24 October 2015, San Jose, California.

The Challenges of repowering. Keynote presentation at Conference on Wind Energy and Wildlife Impacts, Berlin, Germany, 10 March 2015.

Research Highlights Altamont Pass 2011-2015. Scientific Review Committee, Oakland, California, 8 July 2015.

Siting wind turbines to minimize raptor collisions: Altamont Pass Wind Resource Area. US Fish and Wildlife Service Golden Eagle Working Group, Sacramento, California, 8 January 2015.

Evaluation of nest boxes as a burrowing owl conservation strategy. Sacramento Chapter of the Western Section, The Wildlife Society. Sacramento, California, 26 August 2013.

Predicting collision hazard zones to guide repowering of the Altamont Pass. Conference on wind

power and environmental impacts. Stockholm, Sweden, 5-7 February 2013.

Impacts of Wind Turbines on Wildlife. California Council for Wildlife Rehabilitators, Yosemite, California, 12 November 2012.

Impacts of Wind Turbines on Birds and Bats. Madrone Audubon Society, Santa Rosa, California, 20 February 2012.

Comparing Wind Turbine Impacts across North America. California Energy Commission Staff Workshop: Reducing the Impacts of Energy Infrastructure on Wildlife, 20 July 2011.

Siting Repowered Wind Turbines to Minimize Raptor Collisions. California Energy Commission Staff Workshop: Reducing the Impacts of Energy Infrastructure on Wildlife, 20 July 2011.

Siting Repowered Wind Turbines to Minimize Raptor Collisions. Alameda County Scientific Review Committee meeting, 17 February 2011

Comparing Wind Turbine Impacts across North America. Conference on Wind energy and Wildlife impacts, Trondheim, Norway, 3 May 2011.

Update on Wildlife Impacts in the Altamont Pass Wind Resource Area. Raptor Symposium, The Wildlife Society—Western Section, Riverside, California, February 2011.

Siting Repowered Wind Turbines to Minimize Raptor Collisions. Raptor Symposium, The Wildlife Society - Western Section, Riverside, California, February 2011.

Wildlife mortality caused by wind turbine collisions. Ecological Society of America, Pittsburgh, Pennsylvania, 6 August 2010.

Map-based repowering and reorganization of a wind farm to minimize burrowing owl fatalities. California burrowing Owl Consortium Meeting, Livermore, California, 6 February 2010.

Environmental barriers to wind power. Getting Real About Renewables: Economic and Environmental Barriers to Biofuels and Wind Energy. A symposium sponsored by the Environmental & Energy Law & Policy Journal, University of Houston Law Center, Houston, 23 February 2007.

Lessons learned about bird collisions with wind turbines in the Altamont Pass and other US wind farms. Meeting with Japan Ministry of the Environment and Japan Ministry of the Economy, Wild Bird Society of Japan, and other NGOs Tokyo, Japan, 9 November 2006.

Lessons learned about bird collisions with wind turbines in the Altamont Pass and other US wind farms. Symposium on bird collisions with wind turbines. Wild Bird Society of Japan, Tokyo, Japan, 4 November 2006.

Responses of Fresno kangaroo rats to habitat improvements in an adaptive management framework. California Society for Ecological Restoration (SERCAL) 13th Annual Conference, UC Santa Barbara, 27 October 2006.

Fatality associations as the basis for predictive models of fatalities in the Altamont Pass Wind Resource Area. EEI/APLIC/PIER Workshop, 2006 Biologist Task Force and Avian Interaction with Electric Facilities Meeting, Pleasanton, California, 28 April 2006.

Burrowing owl burrows and wind turbine collisions in the Altamont Pass Wind Resource Area. The Wildlife Society - Western Section Annual Meeting, Sacramento, California, February 8, 2006.

Mitigation at wind farms. Workshop: Understanding and resolving bird and bat impacts. American Wind Energy Association and Audubon Society. Los Angeles, CA. January 10 and 11, 2006.

Incorporating data from the California Wildlife Habitat Relationships (CWHHR) system into an impact assessment tool for birds near wind farms. Shawn Smallwood, Kevin Hunting, Marcus Yee, Linda Spiegel, Monica Parisi. Workshop: Understanding and resolving bird and bat impacts. American Wind Energy Association and Audubon Society. Los Angeles, CA. January 10 and 11, 2006.

Toward indicating threats to birds by California's new wind farms. California Energy Commission, Sacramento, May 26, 2005.

Avian collisions in the Altamont Pass. California Energy Commission, Sacramento, May 26, 2005.

Ecological solutions for avian collisions with wind turbines in the Altamont Pass Wind Resource Area. EPRI Environmental Sector Council, Monterey, California, February 17, 2005.

Ecological solutions for avian collisions with wind turbines in the Altamont Pass Wind Resource Area. The Wildlife Society—Western Section Annual Meeting, Sacramento, California, January 19, 2005.

Associations between avian fatalities and attributes of electric distribution poles in California. The Wildlife Society - Western Section Annual Meeting, Sacramento, California, January 19, 2005.

Minimizing avian mortality in the Altamont Pass Wind Resources Area. UC Davis Wind Energy Collaborative Forum, Palm Springs, California, December 14, 2004.

Selecting electric distribution poles for priority retrofitting to reduce raptor mortality. Raptor Research Foundation Meeting, Bakersfield, California, November 10, 2004.

Responses of Fresno kangaroo rats to habitat improvements in an adaptive management framework. Annual Meeting of the Society for Ecological Restoration, South Lake Tahoe, California, October 16, 2004.

Lessons learned from five years of avian mortality research at the Altamont Pass Wind Resources Area in California. The Wildlife Society Annual Meeting, Calgary, Canada, September 2004.

The ecology and impacts of power generation at Altamont Pass. Sacramento Petroleum Association, Sacramento, California, August 18, 2004.

Burrowing owl mortality in the Altamont Pass Wind Resource Area. California Burrowing Owl Consortium meeting, Hayward, California, February 7, 2004.

Burrowing owl mortality in the Altamont Pass Wind Resource Area. California Burrowing Owl Symposium, Sacramento, November 2, 2003.

Raptor Mortality at the Altamont Pass Wind Resource Area. National Wind Coordinating Committee, Washington, D.C., November 17, 2003.

Raptor Behavior at the Altamont Pass Wind Resource Area. Annual Meeting of the Raptor Research Foundation, Anchorage, Alaska, September, 2003.

Raptor Mortality at the Altamont Pass Wind Resource Area. Annual Meeting of the Raptor Research Foundation, Anchorage, Alaska, September, 2003.

California mountain lions. Ecological & Environmental Issues Seminar, Department of Biology, California State University, Sacramento, November, 2000.

Intra- and inter-turbine string comparison of fatalities to animal burrow densities at Altamont Pass. National Wind Coordinating Committee, Carmel, California, May, 2000.

Using a Geographic Positioning System (GPS) to map wildlife and habitat. Annual Meeting of the Western Section of The Wildlife Society, Riverside, CA, January, 2000.

Suggested standards for science applied to conservation issues. Annual Meeting of the Western Section of The Wildlife Society, Riverside, CA, January, 2000.

The indicators framework applied to ecological restoration in Yolo County, California. Society for Ecological Restoration, September 25, 1999.

Ecological restoration in the context of animal social units and their habitat areas. Society for Ecological Restoration, September 24, 1999.

Relating Indicators of Ecological Health and Integrity to Assess Risks to Sustainable Agriculture and Native Biota. International Conference on Ecosystem Health, August 16, 1999.

A crosswalk from the Endangered Species Act to the HCP Handbook and real HCPs. Southern California Edison, Co. and California Energy Commission, March 4-5, 1999.

Mountain lion track counts in California: Implications for Management. Ecological & Environmental Issues Seminar, Department of Biological Sciences, California State University, Sacramento, November 4, 1998.

“No Surprises” -- Lack of science in the HCP process. California Native Plant Society Annual Conservation Conference, The Presidio, San Francisco, September 7, 1997.

In Your Interest. A half hour weekly show aired on Channel 10 Television, Sacramento. In this episode, I served on a panel of experts discussing problems with the implementation of the

Endangered Species Act. Aired August 31, 1997.

Spatial scaling of pocket gopher (*Geomysidae*) density. Southwestern Association of Naturalists 44th Meeting, Fayetteville, Arkansas, April 10, 1997.

Estimating prairie dog and pocket gopher burrow volume. Southwestern Association of Naturalists 44th Meeting, Fayetteville, Arkansas, April 10, 1997.

Ten years of mountain lion track survey. Fifth Mountain Lion Workshop, San Diego, February 27, 1996.

Study and interpretive design effects on mountain lion density estimates. Fifth Mountain Lion Workshop, San Diego, February 27, 1996.

Small animal control. Session moderator and speaker at the California Farm Conference, Sacramento, California, Feb. 28, 1995.

Small animal control. Ecological Farming Conference, Asyloamar, California, Jan. 28, 1995.

Habitat associations of the Swainson's Hawk in the Sacramento Valley's agricultural landscape. 1994 Raptor Research Foundation Meeting, Flagstaff, Arizona.

Alfalfa as wildlife habitat. Seed Industry Conference, Woodland, California, May 4, 1994.

Habitats and vertebrate pests: impacts and management. Managing Farmland to Bring Back Game Birds and Wildlife to the Central Valley. Yolo County Resource Conservation District, U.C. Davis, February 19, 1994.

Management of gophers and alfalfa as wildlife habitat. Orland Alfalfa Production Meeting and Sacramento Valley Alfalfa Production Meeting, February 1 and 2, 1994.

Patterns of wildlife movement in a farming landscape. Wildlife and Fisheries Biology Seminar Series: Recent Advances in Wildlife, Fish, and Conservation Biology, U.C. Davis, Dec. 6, 1993.

Alfalfa as wildlife habitat. California Alfalfa Symposium, Fresno, California, Dec. 9, 1993.

Management of pocket gophers in Sacramento Valley alfalfa. California Alfalfa Symposium, Fresno, California, Dec. 8, 1993.

Association analysis of raptors in a farming landscape. Plenary speaker at Raptor Research Foundation Meeting, Charlotte, North Carolina, Nov. 6, 1993.

Landscape strategies for biological control and IPM. Plenary speaker, International Conference on Integrated Resource Management and Sustainable Agriculture, Beijing, China, Sept. 11, 1993.

Landscape Ecology Study of Pocket Gophers in Alfalfa. Alfalfa Field Day, U.C. Davis, July 1993.

Patterns of wildlife movement in a farming landscape. Spatial Data Analysis Colloquium, U.C.

Davis, August 6, 1993.

Sound stewardship of wildlife. Veterinary Medicine Seminar: Ethics of Animal Use, U.C. Davis. May 1993.

Landscape ecology study of pocket gophers in alfalfa. Five County Grower's Meeting, Tracy, California. February 1993.

Turbulence and the community organizers: The role of invading species in ordering a turbulent system, and the factors for invasion success. Ecology Graduate Student Association Colloquium, U.C. Davis. May 1990.

Evaluation of exotic vertebrate pests. Fourteenth Vertebrate Pest Conference, Sacramento, California. March 1990.

Analytical methods for predicting success of mammal introductions to North America. The Western Section of the Wildlife Society, Hilo, Hawaii. February 1988.

A state-wide mountain lion track survey. Sacramento County Dept Parks and Recreation. April 1986.

The mountain lion in California. Davis Chapter of the Audubon Society. October 1985.

Ecology Graduate Student Seminars, U.C. Davis, 1985-1990: Social behavior of the mountain lion; Mountain lion control; Political status of the mountain lion in California.

Other forms of Participation at Professional Meetings

- Scientific Committee, Conference on Wind energy and Wildlife impacts, Berlin, Germany, March 2015.
- Scientific Committee, Conference on Wind energy and Wildlife impacts, Stockholm, Sweden, February 2013.
- Workshop co-presenter at Birds & Wind Energy Specialist Group (BAWESG) Information sharing week, Bird specialist studies for proposed wind energy facilities in South Africa, Endangered Wildlife Trust, Darling, South Africa, 3-7 October 2011.
- Scientific Committee, Conference on Wind energy and Wildlife impacts, Trondheim, Norway, 2-5 May 2011.
- Chair of Animal Damage Management Session, The Wildlife Society, Annual Meeting, Reno, Nevada, September 26, 2001.
- Chair of Technical Session: Human communities and ecosystem health: Comparing perspectives and making connection. Managing for Ecosystem Health, International Congress on Ecosystem Health, Sacramento, CA August 15-20, 1999.

- Student Awards Committee, Annual Meeting of the Western Section of The Wildlife Society, Riverside, CA, January, 2000.
- Student Mentor, Annual Meeting of the Western Section of The Wildlife Society, Riverside, CA, January, 2000.

Printed Mass Media

Smallwood, K.S., D. Mooney, and M. McGuinness. 2003. We must stop the UCD biolab now. Op-Ed to the Davis Enterprise.

Smallwood, K.S. 2002. Spring Lake threatens Davis. Op-Ed to the Davis Enterprise.

Smallwood, K.S. Summer, 2001. Mitigation of habitation. The Flatlander, Davis, California.

Entrikan, R.K. and K.S. Smallwood. 2000. Measure O: Flawed law would lock in new taxes. Op-Ed to the Davis Enterprise.

Smallwood, K.S. 2000. Davis delegation lobbies Congress for Wildlife conservation. Op-Ed to the Davis Enterprise.

Smallwood, K.S. 1998. Davis Visions. The Flatlander, Davis, California.

Smallwood, K.S. 1997. Last grab for Yolo's land and water. The Flatlander, Davis, California.

Smallwood, K.S. 1997. The Yolo County HCP. Op-Ed to the Davis Enterprise.

Radio/Television

PBS News Hour,

FOX News, Energy in America: Dead Birds Unintended Consequence of Wind Power Development, August 2011.

KXJZ Capital Public Radio -- Insight (Host Jeffrey Callison). Mountain lion attacks (with guest Professor Richard Coss). 23 April 2009;

KXJZ Capital Public Radio -- Insight (Host Jeffrey Callison). Wind farm Rio Vista Renewable Power. 4 September 2008;

KQED QUEST Episode #111. Bird collisions with wind turbines. 2007;

KDVS Speaking in Tongues (host Ron Glick), Yolo County HCP: 1 hour. December 27, 2001;

KDVS Speaking in Tongues (host Ron Glick), Yolo County HCP: 1 hour. May 3, 2001;

KDVS Speaking in Tongues (host Ron Glick), Yolo County HCP: 1 hour. February 8, 2001;

KDVS Speaking in Tongues (host Ron Glick & Shawn Smallwood), California Energy Crisis: 1 hour. Jan. 25, 2001;

KDVS Speaking in Tongues (host Ron Glick), Headwaters Forest HCP: 1 hour. 1998;

Davis Cable Channel (host Gerald Heffernon), Burrowing owls in Davis: half hour. June, 2000;

Davis Cable Channel (hosted by Davis League of Women Voters), Measure O debate: 1 hour. October, 2000;

KXTV 10, In Your Interest, The Endangered Species Act: half hour. 1997.

Reviews of Journal Papers (Scientific journals for whom I've provided peer review)

Journal	Journal
American Naturalist	Journal of Animal Ecology
Journal of Wildlife Management	Western North American Naturalist
Auk	Journal of Raptor Research
Biological Conservation	National Renewable Energy Lab reports
Canadian Journal of Zoology	Oikos
Ecosystem Health	The Prairie Naturalist
Environmental Conservation	Restoration Ecology
Environmental Management	Southwestern Naturalist
Functional Ecology	The Wildlife Society--Western Section Trans.
Journal of Zoology (London)	Proc. Int. Congress on Managing for Ecosystem Health
Journal of Applied Ecology	Transactions in GIS
Ecology	Tropical Ecology
Wildlife Society Bulletin	Peer J
Conservation Biology	Biology Open
Western Wildlife	PLOS One
Heliyon	Global Ecology and Conservation
Wildlife Monographs	Renewable and Sustainable Energy Reviews
Biological Control	The Condor

Committees

- Scientific Review Committee, Alameda County, Altamont Pass Wind Resource Area
- Ph.D. Thesis Committee, Steve Anderson, University of California, Davis
- MS Thesis Committee, Marcus Yee, California State University, Sacramento

Other Professional Activities or Products

Testified in Federal Court in Denver during 2005 over the fate of radio-nuclides in the soil at Rocky Flats Plant after exposure to burrowing animals. My clients won a judgment of \$553,000,000. I have also testified in many other cases of litigation under CEQA, NEPA, the Warren-Alquist Act, and other environmental laws. My clients won most of the cases for which I testified.

Testified before Environmental Review Tribunals in Ontario, Canada regarding proposed White

Pines, Amherst Island, and Fairview Wind Energy projects.

Testified in Skamania County Hearing in 2009 on the potential impacts of zoning the County for development of wind farms and hazardous waste facilities.

Testified in deposition in 2007 in the case of O'Dell et al. vs. FPL Energy in Houston, Texas.

Testified in Klickitat County Hearing in 2006 on the potential impacts of the Windy Point Wind Farm.

Memberships in Professional Societies

The Wildlife Society
Raptor Research Foundation

Honors and Awards

Fulbright Research Fellowship to Indonesia, 1987
J.G. Boswell Full Academic Scholarship, 1981 college of choice
Certificate of Appreciation, The Wildlife Society—Western Section, 2000, 2001
Northern California Athletic Association Most Valuable Cross Country Runner, 1984
American Legion Award, Corcoran High School, 1981, and John Muir Junior High, 1977
CIF Section Champion, Cross Country in 1978
CIF Section Champion, Track & Field 2 mile run in 1981
National Junior Record, 20 kilometer run, 1982
National Age Group Record, 1500 meter run, 1978

Community Activities

District 64 Little League Umpire, 2003-2007
Dixon Little League Umpire, 2006-07
Davis Little League Chief Umpire and Board member, 2004-2005
Davis Little League Safety Officer, 2004-2005
Davis Little League Certified Umpire, 2002-2004
Davis Little League Scorekeeper, 2002
Davis Visioning Group member
Petitioner for Writ of Mandate under the California Environmental Quality Act against City of Woodland decision to approve the Spring Lake Specific Plan, 2002
Served on campaign committees for City Council candidates